FRANJO BROSSLER

IZRAGJENI ZADATCI

IZ

NENINOVE ARITMETIKE

ZA

NIŽE RAZREDE.

CIJENA 3 KRUNE.

NAKLADA **J. STUDNIČKE & DRUGA** SARAJEVO.

AUTOGRAFIRAO M. MILOŠEVIĆ U SARAJEVU.

20712

§17. Djeljivost brojeva.

Vježbe:

1.) Zadani su brojevi mjere broja 36.
36 je mnogokratnik zadanih brojeva.

2.) Mjere od 24 jesu: 2, 3, 4, 6, 8, 12
" " 38 " 2, 19,
" " 39 " 3, 13,
" " 57 " 3, 19,
" " 100 " 2, 4, 5, 10, 20, 25, 50

3.) Mnogokratnici broja 3 jesu: 6, 9, 12, 15, 18 itd.
" 8 jesu: 16, 24, 32, 40 itd.
" 14 " 28, 42, 56, 70 "
" 40 " 80, 120, 160, 200 "
" 100 " 200, 300, 400, 500 "

Najveći mnogokratnik nijednog broja ne može se zahtijevati, jer su to neizmjerno veliki brojevi.

4.) Zadani su brojevi prosti. Nemaju druge mjere osim 1 i sama sebe.

5.) Prosti su brojevi: 13, 23, 83, 93, 89.
Ostali su složeni brojevi.

Zadaci:

1.) Mjere broja 12 jesu: 2, 3, 4, 6.
4 je mjera broja 12, jer je bez ostatka sadržano u 12. Iz toga je razloga 12 mnogokratnik broja 4. Najmanja je mjera 2, a najveća 6.

2.) Najmanja mjera od 28 je 2, najveća 14. – 28 je mnogokratnik brojeva: 2, 4, 7, 14.

3.) Prosti su brojevi: 11, 13, 19, 29. Ostali su složeni. Ujere broja 18 jesu: 2, 3, 6, 9.

4.) Prosti su brojevi: 1, 2, 3, 5, 7
11, 13, 17, 19,
23, 29, 31, 37, 41, 43, 47
53, 59, 61, 67, 71, 73, 79, 83, 89, 97

5.) Djeljivi su sa 2 ovi brojevi: 16, 44, 138, 3074, 47386. Drugi nijesu.

6.) Djeljivi su sa 3 ovi brojevi: 318, 423, 17253, 132891, 1783290. Drugi nijesu.

7.) Djeljivi su sa 4 ovi brojevi: 152, 372, 556, 3824, 720032, 1305756. Drugi nijesu.

8.) Djeljivi su sa 9 ovi brojevi: 108, 387, 5436. Drugi nijesu.

9.) Sa 2 su djeljivi: 5748, 1234, 2700, 617310, 34560, 129432.
-"- 3 -"- -"- : 5748, 735, 8019, 2700, 617310, 34560, 129432.
-"- 4 -"- -"- : 5748, 2700, 34560, 129432
-"- 5 -"- -"- : 735, 2700, 617310, 34560,
-"- 8 -"- -"- : 34560, 129432 : 34560
-"- 9 -"- -"- : 5748, 8019, 2700, 617310
-"- 10 -"- -"- : 2700, 617310, 34560,
-"- 100 -"- -"- : 2700,

10.) Sa 3 su djeljivi: 6, 9, 12, 15, 21, 24 i t.d.
" 4 " " : 8, 12, 16, 20, 24, 28, 32, 36 i t.d.
" 6 " " : 12, 18, 24, 30, 36, 42 i t.d.
" 8 " " : 16, 24, 32, 40, 48, 56, 64 "-

11.) 1296

12.) 572. Može se pripisati s proizvoljno koliko-god znamenaka.

13.) Nije, jer zadnje 3 znamenke uzete kao broj nijesu djeljive sa 8.

14.) Jedinice i stotice: (73425).

§ 18. Rastavljanje brojeva na faktore.

1.) Može se lahko izvesti iz predašnjega.

2.) a.)
2110	2
120	2
60	2
30	2
15	3
5	5

b.)
270	2
135	3
45	3
15	3
5	5

c.)
300	2
150	2
75	3
25	5
5	5

d.)
420	2
210	2
105	3
35	5
7	7

e.)
926	2
463	463

3.) a.)
360	2
180	2
90	2
45	3
15	3
5	5

b.)
366	2
183	3
61	61

c.)
540	2
270	2
135	3
45	3
15	3
5	5

d.)
680	2
340	2
170	2
85	5
17	17

e.)
936	2
468	2
234	2
117	3
39	3
13	13

4.) a.) 1000 | 2 — 500 | 2 — 250 | 2 — 125 | 5 — 25 | 5 — 5 | 5

b.) 1500 | 2 — 750 | 2 — 375 | 3 — 125 | 5 — 25 | 5 — 5 | 5

c.) 1536 | 2 — 768 | 2 — 384 | 2 — 192 | 2 — 96 | 2 — 48 | 2 — 24 | 2 — 12 | 2 — 6 | 2 — 3 | 3

d.) 1440 | 2 — 720 | 2 — 360 | 2 — 180 | 2 — 90 | 2 — 45 | 3 — 15 | 3 — 5 | 5

e.) 2646 | 2 — 1323 | 3 — 441 | 3 — 147 | 3 — 49 | 7 — 7 | 7

5.) a.) 3095 | 5 — 619 | 619

b.) 4578 | 2 — 2289 | 3 — 763 | 3 — 257

c.) 5250 | 2 — 2625 | 3 — 875 | 5 — 175 | 5 — 35 | 5 — 7 | 7

d.) 13832 | 2 — 6916 | 2 — 3458 | 2 — 1729 | 1729

§19. Najveća zajednička mjera.

1.) 8 | 2 — 4 | 2 — 2 | 2 ; 12 | 2 — 6 | 2 — 3 | 3 — N. z. m = 2.2 = 4

b.) 24 | 2 — 12 | 2 — 6 | 2 — 3 | 3 ; 60 | 2 — 30 | 2 — 15 | 3 — 5 | 5 — N. z. m = 2.2.3 = 12

c.) 6, 15, N. z. mj. = 3

d.) 15, 24, N. z. m. = 3

e.) 48 | 2 — 24 | 2 — 12 | 2 — 6 | 2 — 3 | 3 ; 60 | 2 — 30 | 2 — 15 | 3 — 5 | 5 — N. z. m. = 2.2.3 = 12

f.) 60 | 2 — 30 | 2 — 15 | 3 — 5 | 5 ; 96 | 2 — 48 | 2 — 24 | 2 — 12 | 2 — 6 | 2 — 3 | 3 — N. z. m = 2.2.3 = 12

g.) 72 | 2 — 36 | 2 — 18 | 2 — 9 | 3 — 3 | 3 ; 80 | 2 — 40 | 2 — 20 | 2 — 10 | 2 — 5 | 5 — N. z. m. = 2.2.2 = 8

2.) a.) 15 | 3 — 5 | 5 ; 21 | 3 — 7 | 7 ; 25 | 5 — 5 | 5 — N. z. m = nemaje!

b.) 18 | 2 — 9 | 3 — 3 | 3 ; 30 | 2 — 15 | 3 — 5 | 5 ; 48 | 2 — 24 | 2 — 12 | 2 — 6 | 2 — 3 | 3 — N. z. m. = 2.3 = 6

c.) 40 | 2 — 20 | 2 — 10 | 2 — 5 | 5 ; 64 | 2 — 32 | 2 — 16 | 2 — 8 | 2 — 4 | 2 — 2 | 2 ; 72 | 2 — 36 | 2 — 18 | 2 — 9 | 3 — 3 | 3 — N. z. m. = 2.2.2 = 8

d.) 300 | 2 — 150 | 2 — 75 | 3 — 25 | 5 — 5 | 5 ; 360 | 2 — 180 | 2 — 90 | 2 — 45 | 3 — 15 | 3 — 5 | 5 ; 840 | 2 — 420 | 2 — 210 | 2 — 105 | 3 — 35 | 5 — 7 | 7 — N. z. m. = 2.2.3.5 = 60

c.) 104 | 2 ; 125 | 3 ; 712 | 2
52 | 2 ; 175 | 5 ; 356 | 2 — Zajedničke mjere nema
26 | 2 ; 35 | 5 ; 178 | 2
13 | 13 ; 7 | 7 ; 89 | 89

3.) a.) 252, 396 | 1 ; b.) 448, 576 | 1
108, 144 | 1 ; 64, 128 | 3
= 36 | 3 ; 2

N. z. m = 36 ; N. z. m = 64

c.) 1710, 4389 | 2 ; d.) 15876, 86435 | 5
741 | 909 | 1 ; 1766 | 7055 | 2
57 | 228 | 3 ; 9 | 1757 | 3
4 ; 1 | 2 | 95
4

N. z. m. = 57 ; Zaj. mjere nema.

e.) 660, 840, 1320

660, 840 | 1 ; 60, 1320 | 22
120, 180 | 3
60 | 2 ; N. z. m = 60

f.) 1836, 504, 324,

324, 504 | 1 ; 36, 1836 | 51
144, 180 | 1
36 | 4 ; N. z. m = 36

g.) 435, 522, 667,

435, 522 | 1 ; 87, 667 | 7
87 | 5 ; 29, 58 | 2

N. z. m = 29

h.) 1554, 3552, 5734

1554, 3552 | 2 ; 222, 5734 | 23
222, 444 | 3 ; 26, 28 | 7
2 ; 2 | 1
13

N. z. m = 2

i.) 16614, 21726, 23430

16614, 21726 | 1 ; 1278, 23430 | 18
1278, 5712 | 3 ; 426 | 3
4

N. z. m. = 426

4.) a.) 2 i 4, b.) 3 i 5, c.) Nema
d.) 2 i 7, 7 i 11, 77 i 2, 22 i 7, 14 i 11, 2 i 11
5.) a.) 2, 3, 6, b.) 2, 4, 8, c.) Nema
d.) 2, 6, 8; 6, 12, 3
e.) 5, 7, 35, f.) 3, 19, 57

§20. Najmanji zajednički mnogokratnik.

1.) a.) 2, 10 ; N. z. mn. = 10

b.) 8, 12 | 2
4, 6 | 2 ; N. z. mn = 24
2, 3

c.) 6, 20 | 2
3, 10

N. z. mn = 60

d.) 6, 8 | 2
3, 4

N. z. mn. = 24

e.) 18, 30 | 2
9, 15 | 3
3, 5

N. z. mn = 90

f.) 18, 48 | 2
9, 24 | 2 ; N. z.
9, 12 | 2 ; mn.
9, 6 | 2 ; = 144
3, 3 | 3
3, 1

g.)
24, 30	2
12, 15	2
6, 15	2
3, 15	3
1 5	

N. z. mn. = 120

h.)
60, 72	2
30, 36	2
15, 18	2
15, 9	3
5, 3	

N. z. mn. = 360

i.)
76, 90	2
38, 45	2
19, 45	

N. z. mn. = 3420

2.) a.) 3, 5, 6 ; N. z. mn. = 30

b.) 3, 5, 8 ; N. z. mn = 120

c.)
4, 6, 9	2
2, 3, 9	3
2, 1, 3	

N. z. mn. = 36

d.) 2, 5, 7

N. z. mn. = 70

e.) 3, 5, 10

N. z. mn. = 30

f.)
6, 8, 12	2
4 6	2
2 3	

N. z. mn. = 24

g.) Tiskarska pogriješka!

h.)
8, 15, 20	2
4, 15, 10	2
2, 15, 5	3
2, 5, 5	5
2, 1, 1	

N. z. mn. = 120

i.)
54, 72, 126	2
27, 36, 63	2
27, 18, 63	2
27, 9, 63	3
9, 3, 21	3
3, 1, 7	3

N. z. mn. = 1512

3.) a.)
5, 6, 10, 12	2,
5, 6	

N. z. mn. = 60

b.) 2, 3, 5, 40

N. z. mn. = 120

c.) 2, 5, 16, 25 ; N. z. mn. = 400

d.) 2, 3, 5, 10 ; N. z. mn. = 30

e.)
5, 12, 16, 20	2
6, 8, 10	2
3, 4, 5	

N. z. mn. = 240

4.) a.)
2, 3, 4, 5, 6	2
2 5 3	

N. z. mn = 60

4.) b.)
35, 9, 14, 18, 21	2
5, 7, 9, 21	3
5, 7, 3, 7	7
5, 1, 3, 1	

N. z. mn = 630

c.)
2, 3, 5, 8, 12, 18, 28, 40	2
6, 9, 14, 20	2
3, 9, 7, 10	3
1, 3, 7, 10	

N. z. mn. = 2520

d.)
5, 12, 8, 10, 28, 21, 15, 30, 60	2
4 14, 21, 30	2
2 7, 21, 15	3
2 7, 7, 5	7
2 1, 1, 5	

N. z. mn. = 840

5.) a.)
468, 624	2
234, 312	2
117, 156	2
117, 78	2
117, 39	3
39, 13	3
13, 13	13
1, 1,	

N. z. mn. = 1972

b.)
378, 462	2
189, 231	3
63, 77	3
21, 77	3
7, 77	7
1 11	

N. z. mn. = 4158

c.)

264, 396	2
132, 198	2
66, 99	2
33, 99	3
11, 33	11
1, 3	

N. z. mn. = 792

d.)

3080, 3465	2
1540, 3465	2
770, 3465	2
385, 3465	3
385, 1155	3
385 385	385

N. z. mn. = 27720

e.)

84, 126, 441	2
42, 63, 441	2
21, 63, 441	3
7, 21, 147	3
7, 7, 49	7
1, 1, 7	

N. z. mn. = 1764.

Obični razlomci

§§ 21., 22., 23. i 24. izostavljeni su radi jednostavne izradbe.

§ 25. Preobražavanje razlomaka.

1.) $\frac{5}{2} = 2\frac{1}{2}$; $\frac{23}{2} = 11\frac{1}{2}$; $\frac{20}{3} = 6\frac{2}{3}$; $\frac{15}{4} = 3\frac{3}{4}$; $\frac{42}{4} = 10\frac{2}{4}$; $\frac{46}{6} = 7\frac{4}{6}$; $\frac{34}{7} = 4\frac{6}{7}$; $\frac{53}{10} = 5\frac{3}{10}$; $\frac{123}{16} = 7\frac{11}{16}$; $\frac{715}{32} = 22\frac{11}{32}$; $\frac{81}{61} = 1\frac{20}{61}$; $\frac{573}{82} = 6\frac{81}{82}$; $\frac{2397}{127} = 18\frac{111}{127}$; $\frac{2178}{33} = 66$; $\frac{2779}{405} = 6\frac{349}{405}$; $\frac{1834}{329} = 5\frac{189}{329}$; $\frac{26853}{724} = 37\frac{65}{724}$; $\frac{89714}{1543} = 5\frac{1259}{1543}$;

2.) $394 : 16 = 24\frac{10}{16} = 24\frac{5}{8}$; $2004 : 317 = 6\frac{102}{317}$

$1536 : 144 = 10\frac{96}{144} = 10\frac{2}{3}$; $49268 : 259 = 190\frac{178}{259}$; $18437 : 421 = 43\frac{334}{421}$; $52642 : 1091 = 48\frac{274}{1091}$;

3.) $1\frac{3}{8} = \frac{11}{8}$; $2\frac{3}{4} = \frac{11}{4}$; $6\frac{7}{8} = \frac{55}{8}$; $3\frac{7}{15} = \frac{52}{15}$; $17\frac{1}{3} = \frac{52}{3}$; $28\frac{1}{5} = \frac{141}{5}$; $102\frac{7}{12} = \frac{1231}{12}$; $24\frac{17}{20} = \frac{497}{20}$; $28\frac{43}{81} = \frac{2311}{81}$; $82\frac{31}{125} = \frac{10281}{125}$; $39\frac{243}{625} = \frac{24618}{625}$;

4.) a.) $\frac{1}{2} = \frac{5}{10}$; $\frac{7}{2} = \frac{35}{10}$; $\frac{2}{5} = \frac{4}{10}$; $\frac{3}{5} = \frac{6}{10}$; $\frac{4}{5} = \frac{8}{10}$; b.) $\frac{3}{4} = \frac{15}{20}$; $\frac{2}{5} = \frac{8}{20}$; $\frac{7}{10} = \frac{14}{20}$; $\frac{9}{5} = \frac{36}{20}$; c.) $\frac{3}{4} = \frac{45}{60}$; $\frac{2}{3} = \frac{40}{60}$; $\frac{5}{6} = \frac{50}{60}$; $\frac{7}{10} = \frac{42}{60}$; $\frac{8}{5} = \frac{96}{60}$; $\frac{13}{6} = \frac{130}{60}$; $\frac{5}{12} = \frac{25}{60}$; $\frac{8}{15} = \frac{32}{60}$; $\frac{7}{20} = \frac{21}{60}$; $\frac{7}{30} = \frac{14}{60}$;

d.) $\frac{3}{4} = \frac{75}{100}$; $\frac{2}{5} = \frac{40}{100}$; $\frac{7}{10} = \frac{70}{100}$; $\frac{9}{20} = \frac{45}{100}$; $\frac{7}{25} = \frac{28}{100}$; e.) $\frac{1}{3} = \frac{48}{144}$; $\frac{3}{4} = \frac{108}{144}$; $\frac{5}{6} = \frac{120}{144}$; $\frac{11}{16} = \frac{264}{144}$; $\frac{4}{9} = \frac{64}{144}$; $\frac{7}{12} = \frac{84}{144}$; $\frac{11}{16} = \frac{99}{144}$; $\frac{5}{36} = \frac{20}{144}$; $\frac{13}{24} = \frac{78}{144}$; $\frac{31}{48} = \frac{93}{144}$;

5.) a.) $\frac{2}{3} = \frac{8}{12}$; $\frac{3}{4} = \frac{9}{12}$; b.) $\frac{4}{5} = \frac{8}{10}$; $\frac{7}{10} = \frac{7}{10}$; c.) $\frac{5}{6} = \frac{25}{30}$; $\frac{7}{15} = \frac{14}{30}$; d.) $\frac{5}{12} = \frac{25}{60}$; $\frac{4}{15} = \frac{16}{60}$; e.) $\frac{3}{8} = \frac{15}{40}$; $\frac{9}{20} = \frac{18}{40}$; f.) $\frac{1}{2} = \frac{6}{12}$; $\frac{2}{3} = \frac{8}{12}$; $\frac{3}{4} = \frac{9}{12}$; g.) $\frac{1}{3} = \frac{10}{30}$; $\frac{5}{6} = \frac{25}{30}$; $\frac{4}{5} = \frac{24}{30}$;

h.) $\frac{1}{2} = \frac{20}{40}$; $\frac{3}{8} = \frac{15}{40}$; $\frac{7}{10} = \frac{28}{40}$;

i.) $\frac{2}{3}=\frac{8}{12}$; $\frac{3}{4}=\frac{9}{12}$; $\frac{5}{6}=\frac{10}{12}$; k.) $\frac{1}{2}=\frac{8}{16}$;
$\frac{3}{4}=\frac{12}{16}$; $\frac{3}{8}=\frac{6}{16}$; $\frac{5}{16}=\frac{5}{16}$; l.) $\frac{3}{8}=\frac{210}{560}$;
$\frac{7}{20}=\frac{196}{560}$; $\frac{13}{28}=\frac{260}{560}$; m.) $\frac{2}{5}=\frac{48}{120}$; $\frac{3}{8}=$
$\frac{45}{120}$; $\frac{4}{15}=\frac{32}{120}$; $\frac{11}{20}=\frac{66}{120}$; n.) $\frac{2}{3}=\frac{320}{480}$;
$\frac{4}{5}=\frac{384}{480}$; $\frac{3}{32}=\frac{45}{480}$; $\frac{9}{40}=\frac{108}{480}$;

o.) $\frac{13}{21}=\frac{676}{1092}$; $\frac{35}{39}=\frac{980}{1092}$; $\frac{5}{12}=\frac{455}{1092}$;
$\frac{7}{52}=\frac{147}{1092}$;

6.) a.) $\frac{12}{18}=\frac{2}{3}$; $\frac{15}{20}=\frac{3}{4}$; $\frac{15}{24}=\frac{5}{8}$;
$\frac{10}{25}=\frac{2}{5}$; $\frac{18}{30}=\frac{3}{5}$; $\frac{20}{36}=\frac{5}{9}$; $\frac{25}{40}=\frac{5}{8}$;
$\frac{14}{48}=\frac{7}{24}$; $\frac{22}{50}=\frac{11}{25}$; $\frac{27}{63}=\frac{3}{7}$; $\frac{48}{64}=\frac{3}{4}$;
$\frac{48}{72}=\frac{2}{3}$; $\frac{60}{84}=\frac{5}{7}$; $\frac{36}{96}=\frac{3}{8}$;

b.) $\frac{102}{141}=\frac{34}{47}$; $\frac{27}{108}=\frac{1}{4}$; $\frac{192}{240}=\frac{4}{5}$;
$\frac{240}{335}=\frac{48}{67}$; $\frac{750}{600}=\frac{5}{4}$; $\frac{625}{1000}=\frac{5}{8}$; $\frac{676}{1092}=$
$=\frac{13}{21}$; $\frac{420}{2520}=\frac{1}{6}$; $\frac{2772}{5148}=\frac{7}{13}$

§.26. Zbrajanje razlomaka.

1.) a.) $\frac{1}{10}+\frac{3}{10}=\frac{4}{10}=\frac{2}{5}$;
b.) $\frac{3}{8}+\frac{5}{8}+\frac{1}{8}=\frac{9}{8}$;
c.) $\frac{5}{7}+\frac{1}{7}+\frac{4}{7}+\frac{3}{7}=\frac{13}{7}$

2.) a.) $3\frac{5}{6}+8=11\frac{5}{6}=\frac{71}{6}$

b.) $7\frac{3}{4}+\frac{3}{4}=7\frac{6}{4}=7\frac{3}{2}=8\frac{1}{2}$
c.) $18\frac{7}{20}+15\frac{17}{20}=33\frac{24}{20}=33\frac{6}{5}=34\frac{1}{5}$
d.) $9\frac{11}{24}+2\frac{19}{24}+12\frac{17}{24}=23\frac{47}{24}=24\frac{23}{24}$

3.) a.) $\frac{1}{2}+\frac{2}{3}=\frac{3}{6}+\frac{4}{6}=\frac{3+4}{6}=\frac{7}{6}$
b.) $\frac{1}{2}+\frac{7}{8}=\frac{4}{8}+\frac{7}{8}=\frac{4+7}{8}=\frac{11}{8}$
c.) $\frac{3}{4}+\frac{3}{5}=\frac{15+12}{20}=\frac{27}{20}$
d.) $\frac{5}{8}+\frac{3}{4}=\frac{5+6}{8}=\frac{11}{8}$
e.) $\frac{1}{3}+\frac{1}{4}+\frac{5}{6}=\frac{4+3+10}{12}=\frac{17}{12}$
f.) $\frac{1}{2}+\frac{3}{4}+\frac{7}{8}=\frac{4+6+7}{8}=\frac{17}{8}$
g.) $\frac{3}{4}+\frac{4}{5}+\frac{5}{6}+\frac{7}{8}=\frac{90+96+100+105}{120}=\frac{391}{120}$

4.) a.) $7\frac{2}{5}+\frac{7}{10}=7\frac{4}{10}+\frac{7}{10}=7\frac{11}{10}=8\frac{1}{10}$
b.) $8\frac{5}{6}+2\frac{7}{15}=8\frac{25}{30}+2\frac{14}{30}=10\frac{39}{30}=$
$11\frac{9}{30}=11\frac{3}{10}$;
c.) $6\frac{5}{12}+3\frac{8}{15}=6\frac{25}{60}+9\frac{57}{60}=9\frac{19}{20}$.

5.) a.) $9\frac{3}{10}+18+7\frac{4}{15}=34\frac{3}{10}+\frac{4}{15}=$
$=34\frac{9}{30}+\frac{8}{30}=34\frac{17}{30}$;
b.) $13\frac{1}{2}+18\frac{3}{5}+\frac{7}{15}=31\frac{1}{2}+\frac{3}{5}+\frac{7}{15}=$
$=31\frac{15}{30}+\frac{18}{30}+\frac{14}{30}=31\frac{47}{30}=32\frac{17}{30}$
c.) $2\frac{4}{7}+3\frac{5}{11}+8\frac{6}{13}=13\frac{4}{7}+\frac{5}{11}+\frac{6}{13}=$
$=13\frac{572+455+462}{1001}=13\frac{1489}{1001}=14\frac{488}{1001}$
d.) $3\frac{2}{4}+15\frac{1}{2}+\frac{11}{12}+1\frac{5}{6}+3\frac{2}{3}=$
$=22\frac{3}{4}+\frac{1}{2}+\frac{11}{12}+\frac{2}{3}=22\frac{9+6+11+8}{12}=$
$=22\frac{34}{12}=24\frac{10}{12}=24\frac{5}{6}$

6.) $28\frac{3}{4} + 6\frac{5}{6} = 34\frac{3}{4} + \frac{5}{6} = 34\frac{9}{12} + \frac{10}{12} =$
$= 34\frac{19}{12} = 35\frac{7}{12}$

7.) $17\frac{3}{8} + 25\frac{5}{15} + 35\frac{4}{7} = 77\frac{3}{8} + \frac{1}{3} + \frac{4}{7} =$
$= 77\frac{63}{168} + \frac{56}{168} + \frac{96}{168} = 77\frac{215}{168} = 78\frac{47}{168}$

8.) $3\frac{1}{4} + 6\frac{1}{5} + 5\frac{3}{8} = 14\frac{1}{4} + \frac{1}{5} + \frac{3}{8} = 14\frac{10}{40} +$
$+ \frac{8}{40} + \frac{15}{40} = 14\frac{33}{40}$ m

9.) $58\frac{3}{8} + 37\frac{1}{4} + 45\frac{1}{2} + 84\frac{5}{8} - 224\frac{3}{8} +$
$+ \frac{1}{4} + \frac{1}{2} = 225\frac{3}{4}$ hl

10.) $7\frac{3}{10} + 12\frac{3}{4} + 8\frac{4}{5} + 15\frac{9}{20} + 19\frac{1}{2} =$
$= 61\frac{3}{10} + \frac{3}{4} + \frac{4}{5} + \frac{9}{20} + \frac{1}{2} = 61\frac{6}{20} + \frac{15}{20} +$
$+ \frac{16}{20} + \frac{9}{20} + \frac{10}{20} = 61\frac{56}{20} = 63\frac{16}{20} =$
$= 63\frac{4}{5}$

11.) $83\frac{3}{4} + 9\frac{2}{5} = 92\frac{3}{4} + \frac{2}{5} = 92\frac{15}{20} + \frac{8}{20} =$
$= 92\frac{23}{20} = 93\frac{3}{20}$ i

12.) $\frac{1}{4} + \frac{1}{5} = \frac{5}{20} + \frac{4}{20} = \frac{9}{20}$ knjige

13.) Jedan radnik svrši na dan $\frac{1}{6}$ cijeloga posla, a drugi $\frac{7}{10}$. Skupa dakle svrše $\frac{1}{6} + \frac{1}{10} = \frac{5}{30} + \frac{3}{30} = \frac{8}{30} =$
$\frac{4}{15}$ posla.

14.) Kroz prvu cijev napuni se dakle za 1 h $\frac{1}{4}$ posude; kroz drugu $\frac{1}{6}$, a kroz treću $\frac{1}{5}$. Za 1 sat se dakle napuni $\frac{1}{4} + \frac{1}{6} + \frac{1}{5} = \frac{15}{60} + \frac{10}{60} + \frac{12}{60} =$
$= \frac{37}{60}$ posude.

§ 27. Oduzimanje razlomaka.

1.) a.) $\frac{5}{8} - \frac{3}{8} = \frac{2}{8} = \frac{1}{4}$
b.) $\frac{9}{16} - \frac{7}{16} = \frac{2}{16} = \frac{1}{8}$
c.) $\frac{17}{20} - \frac{9}{20} = \frac{8}{20} = \frac{2}{5}$

2.) a.) $4\frac{13}{36} - \frac{7}{36} = 4\frac{6}{36} = 4\frac{1}{6}$
b.) $8\frac{3}{10} - \frac{7}{10} = 7\frac{13}{10} - \frac{7}{10} = 7\frac{6}{10} = 7\frac{3}{5}$
c.) $12 - \frac{3}{5} = 11\frac{5}{5} - \frac{3}{5} = 11\frac{2}{5}$
d.) $7\frac{5}{8} - 3\frac{7}{8} = 6\frac{13}{8} - 3\frac{7}{8} = 3\frac{6}{8} = 3\frac{3}{4}$

3.) a.) $\frac{2}{5} - \frac{14}{15} = \frac{6}{15} - \frac{14}{15} = \frac{2}{15}$
b.) $\frac{7}{8} - \frac{1}{4} = \frac{7}{8} - \frac{2}{8} = \frac{5}{8}$
c.) $\frac{3}{4} - \frac{7}{10} = \frac{15}{20} - \frac{14}{20} = \frac{1}{20}$
d.) $\frac{11}{16} - \frac{5}{12} = \frac{33}{48} - \frac{20}{48} = \frac{13}{48}$

4.) a.) $6\frac{7}{8} - 3\frac{2}{3} = 3\frac{7}{8} - \frac{2}{3} = 3\frac{21}{24} - \frac{16}{24} =$
$= 3\frac{5}{24}$
b.) $12\frac{3}{5} - 8\frac{7}{10} = 4\frac{3}{5} - \frac{7}{10} = 4\frac{6}{10} - \frac{7}{10} =$
$= 3\frac{16}{10} - \frac{7}{10} = 3\frac{9}{10}$ i
c.) $10\frac{3}{8} - 5\frac{7}{12} = 5\frac{3}{8} - \frac{7}{12} = 5\frac{9}{24} - \frac{14}{24} =$
$= 4\frac{33}{24} - \frac{14}{24} = 4\frac{19}{24}$ i

5.) a.) $8\frac{7}{25} - 3 = 5\frac{7}{25}$ i
b.) $24\frac{7}{10} - 21 = 3\frac{7}{10}$ i
c.) $53 - 27\frac{23}{60} = 26 - \frac{23}{60} = 25\frac{60}{60} -$
$- \frac{23}{60} = 25\frac{37}{60}$

6.) a.) $188\frac{4}{9} - 56\frac{3}{10} = 132\frac{40}{90} - \frac{27}{90} = 132\frac{13}{90}$

b.) $237\frac{119}{120} - 125\frac{43}{56} = 112\frac{833}{840} - \frac{645}{840} =$

$= 112\frac{188}{840} = 112\frac{47}{210}$;

7.) $17\frac{1}{8} - 4\frac{2}{3} = 13\frac{3}{24} - \frac{16}{24} = 12\frac{27}{24} - \frac{16}{24} =$

$= 12\frac{11}{24}$;

8.) a.) $\frac{6}{12} - \frac{5}{11} = \frac{66}{132} - \frac{60}{132} = \frac{6}{132} = \frac{1}{22}$

b.) $\frac{7}{13} - \frac{5}{11} = \frac{77}{143} - \frac{65}{143} = \frac{12}{143}$

c.) $\frac{8}{14} - \frac{5}{11} = \frac{88}{154} - \frac{70}{154} = \frac{18}{154} = \frac{9}{77}$

9.) a.) $\frac{7}{8} - \frac{6}{7} = \frac{49}{56} - \frac{48}{56} = \frac{1}{56}$

b.) $\frac{7}{8} - \frac{5}{6} = \frac{42}{48} - \frac{40}{48} = \frac{2}{48} = \frac{1}{24}$

c.) $\frac{7}{8} - \frac{4}{5} = \frac{35}{40} - \frac{32}{40} = \frac{3}{40}$

10.) $3\frac{1}{2} + 8\frac{2}{3} + 19\frac{5}{12} = 30\frac{6}{12} + \frac{8}{12} + \frac{5}{12} =$

$= 30\frac{19}{12} = 31\frac{7}{12}$;

$31\frac{54}{84} - 31\frac{7}{12} = \frac{54}{84} - \frac{49}{84} = \frac{5}{84}$

11.) $17\frac{1}{10} - 2\frac{9}{8} = 15\frac{11}{10} - \frac{45}{40} = 14\frac{48}{40} - \frac{45}{40} = 14\frac{29}{40}$

12.) $234\frac{3}{8} - 194\frac{2}{5} = 40\frac{15}{40} - \frac{16}{40} = 39\frac{55}{40} - \frac{16}{40} = 39\frac{39}{40}$

13.) a.) $36\frac{3}{10} - 28\frac{3}{4} = 8\frac{6}{20} - \frac{15}{20} = 7\frac{26}{20} - \frac{15}{20} = 7\frac{11}{20}$ kl

b.) $28\frac{3}{4} - 23\frac{7}{10} = 5\frac{15}{20} - \frac{14}{20} = 5\frac{1}{20}$ kl

14.) $87\frac{3}{10} - 12\frac{1}{4} = 75\frac{6}{20} - \frac{5}{20} = 75\frac{1}{20}$ kl

15.) $2484 + 394\frac{2}{5} + 420\frac{3}{4} = 3298\frac{2}{5} + \frac{3}{4} =$

$3298\frac{8}{20} + \frac{15}{20} = 3299\frac{3}{20}$ kg = težina bačava sa robom ;

$18\frac{1}{5} + 17\frac{7}{8} + 19\frac{1}{2} = 54\frac{1}{5} + \frac{7}{8} + \frac{1}{2} =$

$= 54\frac{8}{40} + \frac{35}{40} + \frac{20}{40} = 54\frac{63}{40} = 55\frac{23}{40}$ kg =

= težina samih bačava.

$3299\frac{3}{20} - 55\frac{23}{40} = 3241\frac{6}{40} - \frac{23}{40} =$

$= 3243\frac{46}{40} - \frac{23}{40} = 3243\frac{23}{40}$ kg = težina robe.

16.) $80\frac{1}{2} + 137\frac{3}{5} + 103\frac{3}{4} = 320\frac{1}{2} + \frac{3}{5} + \frac{3}{4} =$

$= 320\frac{10}{20} + \frac{12}{20} + \frac{15}{20} = 320\frac{37}{20} = 321\frac{17}{20}$ K.

To je sova, koju je Josipa odpeglao!

$340\frac{2}{5} - 321\frac{17}{20} = 19\frac{8}{20} - \frac{17}{20} = 18\frac{28}{20} - \frac{17}{20} =$

$= 18\frac{11}{20}$ K je sova, koju još duguje.

17.) Daljina nije uvijek ista, nego je uvijek za razliku prvih dvaju poteza veća od daljine predidućih dvaju poteza. (Kojeri se o tom konstrukcijom.)

$\frac{1}{x} - \frac{1}{8} = \frac{8}{56} - \frac{7}{56} = \frac{1}{56}$ m = udaljenost prvih dvaju poteza. Udaljenost drugih dvaju poteza = $\frac{2}{56}$, trećih $\frac{3}{56}$ i t.d.

18.) Za 1 sat doteče kroz prvu cijev $\frac{1}{10}$ rezervoara. Da voda kroz drugu cijev ne odiče, bilo bi iza jednog sata u svemu $\frac{7}{9} + \frac{1}{10} = \frac{70}{90} + \frac{9}{90} = \frac{79}{90}$ rezervoara vode. Budući da kroz drugu cijev dotče za 1 sat $\frac{1}{6}$ rezervoara, to će iza jednog sata u istinu biti $\frac{79}{90} - \frac{1}{6} =$

$= \frac{79}{90} - \frac{15}{90} = \frac{64}{90} = \frac{32}{45}$ rezervoara vode.

19.) $\frac{4}{5} - \frac{2}{3} = \frac{12}{15} - \frac{10}{15} = \frac{2}{15}$ m je razlika pojedinih dijelova.

20.) $33\frac{7}{10} - 21\frac{83}{100} = 12\frac{70}{100} - \frac{83}{100} = 11\frac{170}{100} - \frac{83}{100} = 11\frac{87}{100}$ kg.

§ 28. Množenje razlomaka s cijelim brojem.

1.) a.) $\frac{3}{7} \times 8 = \frac{24}{7}$; b.) $\frac{5}{14} \times 2 = \frac{10}{14}$;
c.) $\frac{7}{8} \times 12 = \frac{84}{8}$; d.) $\frac{7}{30} \times 15 = \frac{105}{30} = \frac{7}{2}$

2.) a.) $3\frac{5}{6} \times 8 = 24\frac{40}{6} = 30\frac{4}{6} = 30\frac{2}{3}$
b.) $17\frac{4}{5} \times 10 = 170\frac{40}{5} = 178$;
c.) $24\frac{5}{16} \times 8 = 192\frac{40}{16} = 194\frac{8}{16} = 194\frac{1}{2}$

3.) a.) $73\frac{5}{8} \times 24 = 1752\frac{120}{8} = 1767$
b.) $124\frac{4}{9} \times 42 = 5208\frac{168}{9} = 5226\frac{6}{9} = 5226\frac{2}{3}$
c.) $183\frac{11}{12} \times 63 = 11529\frac{441}{12} = 11565\frac{9}{12} = 11565\frac{3}{4}$;

4.) $7\frac{11}{16} \times 36 = 252\frac{396}{16} = 276\frac{12}{16} = 276\frac{3}{4}$;

5.) a.) $3\frac{4}{5} \times 6 = 18\frac{24}{5} = 22\frac{4}{5}$ K u nedjelji dana. b.) $3\frac{4}{5} \times 31 = 93\frac{124}{5} = 117\frac{4}{5}$ K u srpnju. c.) $3\frac{4}{5} \times 30 = 90\frac{120}{5} = 114$ K u lipnju.

6.) a.) $4\frac{7}{20} \times 6 = 24\frac{42}{20} = 26\frac{2}{20} = 26\frac{1}{10}$ K
b.) $4\frac{7}{20} \times 15 = 60\frac{105}{20} = 65\frac{5}{20} = 65\frac{1}{4}$ K.

7.) Jedan radnik treba 6 puta toliko vremena. $12\frac{1}{2} \times 6 = 72\frac{6}{2} = 75$ dana.

8.) a.) $2\frac{7}{15} \times 9 = 18\frac{63}{15} = 22\frac{3}{15} = 22\frac{1}{5}$ kg (zlatna kugla); b.) $1\frac{1}{3} \times 9 = 9\frac{9}{3} = 12$ kg (srebrena kugla).

9.) a.) $8\frac{1}{4} \times 2 = 16\frac{2}{4} = 16\frac{1}{2}$ K.
b.) $8\frac{1}{4} \times 5 = 40\frac{5}{4} = 41\frac{1}{4}$ K.

9.) c.) $8\frac{1}{4} \times 13 = 104\frac{13}{4} = 107\frac{1}{4}$ K
d.) $8\frac{1}{4} \times 268 = 2144\frac{268}{4} = 2211$ K

10.) a.) $\frac{2}{25} \times 15 = \frac{30}{25} = \frac{6}{5} = 1\frac{1}{5}$ hl
b.) 8 konja treba za 1 dan $8 \times \frac{2}{25}$, a za 35 dana 35 puta toliko. Dakle $\frac{16}{25} \times 35 = \frac{112}{5} = 22\frac{2}{5}$ hl.

11.) $32\frac{2}{5} + 29\frac{3}{4} \times 120 = 32\frac{2}{5} + 3480\frac{360}{4} = 32\frac{2}{5} + 3570 = 3602\frac{2}{5}$ l

12.) $53\frac{3}{20} \times 24 = 1272\frac{72}{20} = 1275\frac{12}{20} = 1275\frac{3}{5}$ K

§ 29. Dijeljenje razlomaka s cijelim brojevima.

1.) a.) $\frac{10}{13} : 5 = \frac{2}{13}$; b.) $\frac{9}{10} : 3 = \frac{3}{10}$;
c.) $\frac{16}{5} : 4 = \frac{4}{5}$; d.) $\frac{63}{100} : 9 = \frac{7}{100}$;

2.) a.) $\frac{3}{4} : 2 = \frac{3}{8}$; b.) $\frac{5}{6} : 3 = \frac{5}{18}$;
c.) $\frac{16}{15} : 5 = \frac{16}{75}$; d.) $\frac{8}{13} : 3 = \frac{8}{39}$
e.) $\frac{14}{17} : 21 = \frac{2}{17} : 3 = \frac{2}{51}$

3.) a.) $3\frac{5}{7} : 5 = \frac{26}{7} : 5 = \frac{26}{35}$
b.) $12\frac{3}{5} : 7 = \frac{63}{5} : 7 = \frac{9}{5}$
c.) $12\frac{6}{7} : 2 = 6\frac{3}{7}$
d.) $100\frac{5}{8} : 5 = 20\frac{1}{8}$

4.) a.) $26\frac{2}{3} : 5 = \frac{80}{3} : 5 = \frac{16}{3}$
b.) $244\frac{11}{4} : 24 = \frac{7224}{5} : 24 = \frac{57}{5} = 10\frac{1}{5}$
c.) $433\frac{1}{3} : 100 = \frac{1300}{3} : 100 = \frac{13}{3} = 4\frac{1}{3}$
d.) $60\frac{1}{2} : 11 = \frac{124}{2} : 11 = \frac{11}{2} = 5\frac{1}{2}$

5.) a.) polovina od $\frac{1}{2} = \frac{1}{2} : 2 = \frac{1}{4}$
-11- -11- $\frac{1}{3} = \frac{1}{3} : 2 = \frac{1}{6}$

polovina od $\frac{1}{4} = \frac{1}{4} : 2 = \frac{1}{8}$
" " $\frac{1}{5} = \frac{1}{5} : 2 = \frac{1}{10}$
b.) trecina od $\frac{1}{2} = \frac{1}{2} : 3 = \frac{1}{6}$
" " $\frac{1}{4} = \frac{1}{4} : 3 = \frac{1}{12}$
" " $\frac{1}{5} = \frac{1}{5} : 3 = \frac{1}{15}$

6.) a) $1\frac{1}{3} : 5 = \frac{4}{3} : 5 = \frac{4}{15}$
b.) $2\frac{5}{6} : 3 = \frac{17}{6} : 3 = \frac{17}{18}$
c.) $5\frac{5}{12} : 6 = \frac{65}{12} : 6 = \frac{65}{72}$
d.) $7\frac{2}{3} : 8 = \frac{23}{3} : 8 = \frac{23}{24}$

7.) $74\frac{1}{2} : 31 = \frac{149}{2} : 31 = \frac{149}{62} = 2\frac{25}{62}$ K stojí 1 kg.

8.) $184\frac{4}{5} : 24 = \frac{2424}{5} : 24 = \frac{101}{5} = 20\frac{1}{5}$

9.) $14\frac{1}{2} : 5 = \frac{29}{2} : 5 = \frac{29}{10} = 2\frac{1}{10}$ dňa

10.) $35\frac{3}{5} : 6 = 105 + 5\frac{3}{5} : 6 = 105 + \frac{28}{5} : 6 = 105\frac{28}{30} = 105\frac{14}{15}$

11.) $36\frac{4}{5} : 8 = 4 + 4\frac{4}{5} : 8 = 4 + \frac{24}{5} : 8 = 4\frac{3}{5}$

12. Za 1 mesiac prislúchi $21\frac{3}{5} : 9 = 2 + 3\frac{3}{5} : 9 = 2 + \frac{18}{5} : 9 = 2\frac{2}{5}$ K. Za 1 rok dňa prislúchi dokle $2\frac{2}{5} \times 52 = 104\frac{104}{5} = 124\frac{4}{5}$ K.

§ 30. Množenie zlomkom.

1.) a) $7 \times \frac{2}{3} = \frac{14}{3}$; b.) $6 \times \frac{4}{9} = \frac{24}{9} = \frac{8}{3}$;
c.) $10 \times \frac{2}{5} = 4$; d.) $208 \times \frac{11}{20} = \frac{2288}{20}$
e.) $36 \times \frac{4}{9} = 16$

2.) a) $6 \times 1\frac{5}{6} = 6 \times \frac{11}{6} = \frac{66}{6} = 11$

b.) $24 \times 2\frac{3}{8} = 24 \times \frac{19}{8} = 57$
c.) $28 \times 3\frac{4}{7} = 28 \times \frac{25}{7} = 100$
d.) $35 \times \frac{4}{15} = 7 \times \frac{4}{3} = \frac{28}{3}$
e.) $42 \cdot 1\frac{1}{35} = 42 \cdot \frac{36}{35} = 6 \cdot \frac{36}{35} = \frac{216}{5} = 43\frac{1}{5}$
f.) $45 \cdot 10\frac{7}{22} = 45 \cdot \frac{227}{22} = \frac{10215}{22} = 464\frac{7}{22}$
3.) $\frac{2}{8} \cdot \frac{3}{4} = \frac{3}{16}$; b.) $\frac{9}{10} \cdot \frac{5}{6} = \frac{3}{4}$
c.) $\frac{24}{25} \cdot \frac{5}{8} = \frac{3}{5}$; d.) $\frac{3}{8} \times \frac{22}{33} = \frac{4}{11}$
e.) $\frac{52}{43} \cdot \frac{17}{26} = \frac{34}{43}$

4.) a.) $5\frac{5}{6} \cdot \frac{3}{8} = \frac{35}{6} \cdot \frac{3}{8} = \frac{35}{16}$
b.) $8\frac{3}{4} \cdot \frac{3}{4} = \frac{35}{4} \cdot \frac{3}{4} = \frac{105}{16}$
c.) $12\frac{1}{2} \cdot \frac{4}{5} = \frac{25}{2} \cdot \frac{4}{5} = 10$
d.) $7\frac{5}{8} \cdot \frac{4}{5} = \frac{61}{8} \cdot \frac{4}{5} = \frac{61}{10}$
e.) $16\frac{1}{2} \cdot \frac{5}{11} = \frac{33}{2} \cdot \frac{5}{11} = \frac{15}{2}$

5.) a.) $5\frac{2}{3} \cdot 1\frac{3}{4} = \frac{17}{3} \cdot \frac{7}{4} = \frac{119}{12}$
b.) $1\frac{2}{3} \cdot 1\frac{1}{5} = \frac{5}{3} \cdot \frac{6}{5} = 2$
c.) $8\frac{2}{3} \cdot 2\frac{5}{6} = \frac{26}{3} \cdot \frac{17}{6} = \frac{221}{9}$
d.) $36\frac{5}{6} : 28\frac{1}{2} = \frac{221}{6} : \frac{57}{2} = \frac{4199}{4}$
e.) $12\frac{5}{6} : 19\frac{5}{8} = \frac{77}{6} \cdot \frac{157}{8} = \frac{12089}{48}$

6.) a.) $\frac{1}{2} \cdot \frac{1}{3} \cdot \frac{1}{4} = \frac{1}{24}$; b.) $\frac{4}{9} \cdot \frac{5}{6} \cdot \frac{2}{3} = \frac{20}{81}$;
c.) $1\frac{1}{3} \times \frac{6}{7} \times 2\frac{5}{8} = \frac{4}{3} \cdot \frac{6}{7} \cdot \frac{21}{8} = 3$
d.) $\frac{2}{5} \cdot \frac{3}{8} \cdot \frac{4}{9} \cdot \frac{6}{7} = \frac{2}{35}$
e.) $2\frac{1}{3} \cdot 1\frac{3}{4} \cdot 1\frac{1}{9} \cdot 2\frac{2}{5} = \frac{7}{3} \cdot \frac{7}{4} \cdot \frac{10}{9} \cdot \frac{8}{5} = \frac{380}{81}$
f.) $1\frac{1}{3} \cdot 4\frac{1}{5} \cdot 6\frac{2}{9} \cdot 5\frac{2}{3} = \frac{4}{3} \cdot \frac{21}{5} \cdot \frac{56}{9} \cdot \frac{17}{3} = \frac{26656}{135}$

7.) a.) $5 \cdot 3\frac{1}{7} = 5 \cdot \frac{22}{7} = \frac{110}{7}$

b.) $12 \cdot 3\frac{1}{7} = 12 \cdot \frac{22}{7} = \frac{264}{7}$

c.) $9 \cdot 3\frac{1}{7} = 9 \cdot \frac{22}{7} = \frac{198}{7}$

d.) $7 \cdot 3\frac{1}{7} = 7 \cdot \frac{22}{7} = 22$

e.) $28 \cdot 3\frac{1}{7} = 28 \cdot \frac{22}{7} = 88$

8.) Iz zadatka 7. slijedi, da je opseg kruga po prilici $6\frac{2}{7}$ ($2 \times 3\frac{1}{2}$) puta veći od polumjera kruga.

a.) $7\frac{1}{2} \cdot 6\frac{2}{7} = \frac{15}{2} \cdot \frac{44}{7} = \frac{330}{7}$

b.) $5\frac{1}{2} \cdot 6\frac{2}{7} = \frac{11}{2} \cdot \frac{44}{7} = \frac{242}{7}$

c.) $12\frac{1}{2} \cdot 6\frac{2}{7} = \frac{25}{2} \cdot \frac{44}{7} = \frac{550}{7}$

9.) a.) $2\frac{1}{2} \cdot 8\frac{3}{5} = \frac{5}{2} \cdot \frac{43}{5} = \frac{43}{2} = 12\frac{1}{2}$ K

b.) $3\frac{5}{8} \cdot 8\frac{3}{5} = \frac{29}{8} \cdot \frac{43}{5} = \frac{1247}{40} = 31\frac{7}{40}$

c.) $6\frac{3}{4} \cdot 8\frac{3}{5} = \frac{27}{4} \cdot \frac{43}{5} = \frac{1161}{20} = 58\frac{1}{20}$

10.) 1. m sloji $7\frac{1}{2}$ K

2. m sloji $1\frac{1}{2}$ puta prvi $= 1\frac{1}{2} \cdot 7\frac{1}{2} = \frac{3}{2} \cdot \frac{15}{2} = \frac{45}{4} = 11\frac{1}{4}$ K

3. m sloji $1\frac{1}{2}$ puta drugi $= 1\frac{1}{2} \cdot 7\frac{1}{2} \cdot 1\frac{1}{2} = \frac{3}{2} \cdot \frac{15}{2} \cdot \frac{3}{2} = \frac{135}{8} = 16\frac{7}{8}$

4. m sloji $1\frac{1}{2}$ puta treći $= 1\frac{1}{2} \cdot 7\frac{1}{2} \cdot 1\frac{1}{2} \cdot 1\frac{1}{2} = \frac{3}{2} \cdot \frac{15}{2} \cdot \frac{3}{2} \cdot \frac{3}{2} = \frac{405}{16} = 25\frac{5}{16}$

5. m sloji $1\frac{1}{2}$ puta četvrti $= 1\frac{1}{2} \cdot 7\frac{1}{2} \cdot 1\frac{1}{2} \cdot 1\frac{1}{2} \cdot 1\frac{1}{2} = \frac{3}{2} \cdot \frac{15}{2} \cdot \frac{3}{2} \cdot \frac{3}{2} \cdot \frac{3}{2} = \frac{1215}{32} = 37\frac{31}{32}$

Kopanje cijeloga kanala stoji dakle:

$7\frac{1}{2} + \frac{45}{4} + \frac{135}{8} + \frac{405}{16} + \frac{1215}{32} = \frac{240}{32} + \frac{360}{32} + \frac{540}{32} + \frac{810}{32} + \frac{1215}{32} = \frac{3165}{32} = 98\frac{29}{32}$ K

11.) $634\frac{3}{4} \cdot 9\frac{3}{5} = \frac{2539}{4} \cdot \frac{48}{5} = \frac{40624}{5} = 8124\frac{4}{5}$ K

12.) Da voda iz posude kroz drugu cijev ne izliče, valja ih u posudi iza $1\frac{3}{4}$ h $(52\frac{3}{8} + 1\frac{3}{4} \cdot 682\frac{3}{4})$ l vode. Kroz drugu cijev otječe za $1\frac{3}{4}$ h $687\frac{4}{5} \cdot 1\frac{3}{4}$ l vode. Iza $1\frac{3}{4}$ h nalazi se dakle u posudi u višku: $52\frac{3}{8} + 1\frac{3}{4} \cdot 682\frac{3}{4} - 687\frac{4}{5} \cdot 1\frac{3}{4} =$

$= 52\frac{3}{8} + \frac{7}{4} \cdot \frac{2731}{4} - \frac{3439}{5} \cdot \frac{7}{4} = 52\frac{3}{8} +$

$+ \frac{19117}{16} - \frac{24073}{20} = 52\frac{3}{8} + 1194\frac{13}{16} - 1203\frac{13}{20} =$

$= 43\frac{3}{8} + \frac{13}{16} - \frac{13}{20} = 43\frac{30}{80} + \frac{65}{80} - \frac{52}{80} =$

$= 43\frac{43}{80}$ l vode.

13.) Dobitak od svakog kg: prve vrste $= 2\frac{4}{5} - 2\frac{1}{4} = \frac{4}{5} - \frac{1}{4} = \frac{16}{20} - \frac{5}{20} = \frac{11}{20}$ K;

... druge vrste $= 2\frac{4}{5} - 2\frac{7}{10} = \frac{4}{5} - \frac{7}{10} =$

$= \frac{16}{20} - \frac{14}{20} = \frac{2}{20} = \frac{1}{10}$ K; treće vrste $=$

$2\frac{4}{5} - 2\frac{1}{2} = \frac{4}{5} - \frac{1}{2} = \frac{8}{10} - \frac{5}{10} = \frac{3}{10}$;

Na $123\frac{1}{2}$ kg prve vrste dobije dakle:

$123\frac{1}{2} \cdot \frac{11}{20} = \frac{247}{2} \cdot \frac{11}{20} = \frac{2717}{40} = 67\frac{37}{40}$ K

Na $183\frac{3}{4}$ kg druge vrste dobije:

$183\frac{3}{4} \cdot \frac{1}{10} = \frac{735}{4} \cdot \frac{1}{10} = \frac{735}{40} = 18\frac{15}{40}$ K

Na 150 kg treće vrste dobije:

$150 \cdot \frac{3}{10} = 15 \cdot 3 = 45$ K.

U svemu dobije: $67\frac{37}{40} + 18\frac{15}{40} + 45 =$

$= 130\frac{52}{40} = 131\frac{12}{40} = 131\frac{3}{10}$ K.

§ 31. Dijeljenje razlomkom.

1.) a.) $12 : \frac{1}{2} = 24$; b.) $42 : \frac{7}{10} = 6 : \frac{1}{10} = 60$

c.) $5 : 3\frac{2}{3} = 5 : \frac{11}{3} = \frac{15}{11}$;

d.) $46 : 5\frac{3}{4} = 46 : \frac{23}{4} = 2 : \frac{1}{4} = 8$

e.) $57 : 6\frac{8}{15} = 57 : \frac{98}{15} = 57 \cdot \frac{15}{98} = \frac{855}{98}$

2.) a.) $\frac{1}{2} : \frac{3}{8} = 1 : \frac{3}{4} = \frac{4}{3}$; b.) $\frac{9}{14} : \frac{7}{9} = \frac{81}{98}$

c.) $\frac{13}{15} : \frac{5}{12} = \frac{156}{75}$; d.) $\frac{17}{18} : \frac{5}{6} = \frac{17}{3} : 5 = \frac{17}{15}$

3.) a.) $3\frac{2}{3} : 1\frac{1}{2} = \frac{11}{2} : \frac{3}{2} = 11 : 3 = \frac{11}{3}$;

b.) $4\frac{1}{2} : 3\frac{3}{4} = \frac{9}{2} : \frac{15}{4} = 9 : \frac{15}{2} = 3 : \frac{5}{2} = \frac{6}{5}$

c.) $7\frac{1}{5} : 5\frac{2}{3} = \frac{36}{5} : \frac{17}{3} = \frac{108}{85}$

d.) $5\frac{3}{4} : 7\frac{5}{6} = \frac{23}{4} : \frac{47}{6} = \frac{23}{2} \cdot \frac{47}{3} = \frac{69}{94}$

e.) $26\frac{7}{38} : 8\frac{40}{57} = \frac{995}{38} : \frac{443}{57} = \frac{56745}{17024}$

4.) $7 : \frac{3}{4} = \frac{28}{3}$

5.) $210 : 4\frac{3}{8} = 210 : \frac{35}{8} = 6 : \frac{1}{8} = 48$ pari

6.) $3047 : 2\frac{3}{4} = 3047 : \frac{11}{4} = 277 : \frac{1}{4} = 1108$ K

7.) a.) $9\frac{3}{4} : 20\frac{1}{2} = \frac{39}{4} : \frac{41}{2} = \frac{39}{2} : 41 = \frac{39}{82}$ m

b.) Za 2 K dobije se dvapuno toliko $\frac{39}{82} \cdot 2 = \frac{39}{41}$ m

c.) $\frac{39}{82} \cdot 24 = \frac{39}{41} \cdot 12 = \frac{468}{41} = 11\frac{17}{41}$ m

8.) a.) $611\frac{4}{5} : 4\frac{3}{5} = \frac{3059}{5} : \frac{23}{5} = \frac{3059}{23} = 133$

b.) $57 : 1\frac{1}{2} = 57 : \frac{3}{2} = 19 : \frac{1}{2} = 38$

9.) $37\frac{5}{16} - 11\frac{3}{5} = 26\frac{25}{80} - \frac{48}{80} = 25\frac{105}{80} - \frac{48}{80} = 25\frac{57}{80}$

$28\frac{7}{15} - 19\frac{7}{12} = 9\frac{28}{60} - \frac{35}{60} = 8\frac{88}{60} - \frac{35}{60} = 8\frac{53}{60}$

$25\frac{57}{80} : 8\frac{53}{60} = \frac{2057}{80} : \frac{533}{60} = \frac{2057}{4} : \frac{533}{3} = \frac{6171}{2132} = 2\frac{1907}{2132}$

10.) $348 : 2\frac{3}{4} = 348 : \frac{11}{4} = \frac{992}{11} = 90\frac{2}{11}$ K na/godinu.

11.) a.) 1 radnik zasluži $26\frac{3}{4} : 8 = \frac{107}{4} : 8 = \frac{107}{32} = 3\frac{11}{32}$ K na dan

b.) 2 radnika zasluže $3\frac{11}{32} \cdot 2 = 6\frac{11}{16}$ K na dan.

c.) 3 radnika zasluže $3\frac{11}{32} \cdot 3 = 9\frac{33}{32} = 10\frac{1}{32}$ K na dan.

d.) 5 radnika zasluže $3\frac{11}{32} \cdot 5 = 15\frac{55}{32} = 16\frac{23}{32}$ K na dan.

e.) 12 radnika zasluže $3\frac{11}{32} \cdot 12 = 36\frac{33}{8} = 40\frac{1}{8}$ K na dan.

12.) Na svaki hl otpada $204\frac{3}{4} : 15\frac{3}{4} = \frac{819}{4} : \frac{63}{4} = \frac{819}{63} = 13$ K dobitka. Trgovac je dakle hl prodavao po $57\frac{1}{2} + 13 = 64\frac{1}{2}$ K.

13.) $\frac{5}{7} : \frac{3}{8} = \frac{40}{21} = 1\frac{19}{21}$

15.) $661\frac{1}{2} : 6\frac{3}{4} = \frac{1323}{2} : \frac{27}{4} = 1323 : \frac{27}{2} = 147 : \frac{3}{2} = 49 : \frac{1}{2} = 98$ svjetiljaka.

16.) $3571\frac{5}{7} : 16 = \frac{178576}{5} : 16 = \frac{11161}{5} = 2232\frac{1}{5}$ K za dobrodošle svite. Za smove ostaje dakle (zajedno): $3571\frac{5}{7} - 2232\frac{1}{5} = 33483$ K; $33483 \cdot \frac{2}{5} = \frac{66966}{5} = 13393\frac{1}{5}$ K = dobije najstariji brat. Oba mlađa brata dobiju zajedno $33483 - 13393\frac{1}{5} = 20090 - \frac{1}{5} = 20089\frac{4}{5}$ K. Budući da dvojica dobiju jednake dijelove, dobije svaki polovinu preostale svote od mlađe braće dobije dakle svaki $20089\frac{4}{5} : 2 = 10044\frac{2}{10}$ K

17.) Kupio je sladora za polovicu zadane svote $8.j.\ 57\frac{3}{5} : 2 = 28\frac{7}{5} K$. Za istu svotu kupio je kave. Za $28\frac{7}{5} K$ dobio je dakle: $28\frac{7}{5} : \frac{18}{25} = \frac{147}{5} : \frac{18}{25} = 147 : \frac{18}{5} = 8 : \frac{1}{5} =$ $= 40 kg$ sladora. Za $28\frac{7}{5} K$ dobio je $28\frac{7}{5} : 3\frac{1}{5} = \frac{147}{5} : \frac{16}{5} = 147 : 16 = 9 kg$ kave.

18.) U jednom komadu platna ima $\frac{73\frac{1}{4} - 3\frac{1}{4}}{2} = 35 m$ platna. U drugom za $3\frac{1}{4} m$ više, dakle $35 + 3\frac{1}{4} = 38\frac{1}{4}$. Ili: $73\frac{1}{4} - 35 = 38\frac{1}{4} m$; $3\frac{1}{4} m$ platna stoji $4\frac{1}{2} K$. $1 m$ stoji dakle $4\frac{1}{2} : 3\frac{1}{4} = \frac{9}{2} : \frac{13}{4} = 9 : \frac{13}{2} = \frac{18}{13} = 1\frac{5}{13} K$. Prvi komad platna stoji potome: $35 : 1\frac{5}{13} = 35 . \frac{18}{13} = \frac{630}{13} = 48\frac{6}{13} K$, a drugi komad platna: $38\frac{1}{4} . 1\frac{5}{13} = \frac{153}{4} . \frac{18}{13} =$ $= \frac{153}{2} . \frac{9}{13} = \frac{1377}{26} = 52\frac{25}{26} K$

§. 32. Međusobni odnošaj prostih razlomaka i decimalnih brojeva.

Vježbe I.

Pretvaranje prostih razlomaka u decimalni broj.

1.) a.) $\frac{1}{2} = 1 : 2 = 0.5$; b.) $\frac{3}{4} = 3 : 4 = 0.75$

c.) $\frac{5}{8} = 5 : 8 = 0.625$; d.) $\frac{27}{32} = 27 : 32 = 0.84375$

e.) $\frac{52}{54} = \frac{26}{27} = 26 : 27 = 0.\dot{9}6\dot{2}$

f.) $\frac{9}{138} = \frac{9}{46} = 9 : 46 = 0.195652173913$

g.) $3\frac{7}{10} = 3.35$ h.) $8\frac{6}{25} = 8.24$; i.) $13\frac{5}{32} = 13$

g.) $\frac{8}{33} = 0.\dot{2}\dot{4}$; h.) $\frac{31}{33} = 0.\dot{9}\dot{3}$; i.) $\frac{1}{99} = 0.\dot{0}\dot{1}$

k.) $\frac{37}{99} = 0.\dot{3}\dot{7}$

Vježbe II.

Pretvaranje decimalnih brojeva u razlomke.

1.) Dobije se jednovratnik broja 7 t.j. sam broj 7.

2.) Dobije se 8-mo kratnik zadanog broja.

3.) " " 99-tero " " "

Vježbe III.

1.) a.) $0.\dot{7} = \frac{7}{9}$, b.) $0.\dot{3}\dot{4}\dot{5} = \frac{345}{999} = \frac{115}{333}$

c.) $2.\dot{3}\dot{6} = 2\frac{36}{99} = 2\frac{4}{11}$;

d.) $8.\dot{0}\dot{1} = 8\frac{1}{99}$; e.) $3.\dot{9} = 3\frac{9}{9} = 4$

2.) a.) $0.92 + 0.\dot{5}\dot{6} = \frac{92}{100} . \frac{56}{99} = \frac{23}{25} . \frac{56}{99} = \frac{1288}{2475}$

b.) $8\frac{1}{3} . 2.6\dot{2}\dot{1} = \frac{25}{3} . 2\frac{621}{999} = 25 . \frac{2619}{333} =$

$= 25 . \frac{291}{37} = \frac{7275}{37} = 196\frac{23}{37}$

c.) $5.8\dot{1}\dot{9} = 5\frac{8}{9} . 1\frac{9}{9} = 5\frac{8}{9} . 2 = 10\frac{16}{9} = 11\frac{7}{9}$

3.) a.) $7.4 : 2.3 = 7\frac{4}{9} : 2\frac{3}{9} = \frac{64}{9} : \frac{21}{9} = \frac{67}{21} = 3\frac{4}{21}$

b.) $2.\dot{9} : 0.0\dot{9} = 2\frac{9}{9} : \frac{9}{99} = 3 : \frac{1}{11} = 33$

Vježbe IV.

Decimalni je broj nečist periodičan.

1.) a.) $0.2\dot{7} = \frac{27-2}{90} = \frac{25}{90} = \frac{5}{18}$

b.) $0.54\dot{5} = \frac{545-5}{990} = \frac{540}{990} = \frac{6}{11}$

c.) $3.3\dot{1}2\dot{3} = 3\frac{3123-3}{9990} = 3\frac{3120}{9990} = 3\frac{104}{111}$

d.) $4{\cdot}07\dot{2} = 4\frac{72-0}{990} = 4\frac{72}{990} = 4\frac{8}{110} = 4\frac{4}{55}$

e.) $1{\cdot}000\dot{1} = 1\frac{1}{9900}$ i f.) $0{\cdot}8\dot{9} = \frac{89-8}{90} = \frac{81}{90} = \frac{9}{10}$

g.) $2{\cdot}08\dot{9} = 2\frac{89-8}{900} = 2\frac{80}{900} = 2\frac{9}{100}$

h.) $0{\cdot}1\dot{9} = \frac{19-1}{90} = \frac{18}{90} = \frac{1}{5}$

i.) $1{\cdot}00\dot{9} = 1\frac{9}{900} = 1\frac{1}{100}$

2.) a.) $0{\cdot}92 \cdot 0{\cdot}25\dot{6} = \frac{92}{100} \cdot \frac{256-2}{990} = \frac{23}{25} \cdot \frac{254}{990} = \frac{5842}{24750}$

b.) $13{\cdot}42\dot{7} \cdot 1{\cdot}00\dot{6}\dot{9} = 13\frac{427-42}{900} \cdot 1\frac{69-6}{9000} =$

$= 13\frac{385}{900} \cdot 1\frac{63}{9000} = 13\frac{77}{180} \cdot 1\frac{7}{1000} = \frac{2417}{180} \cdot \frac{1007}{1000} =$

$= \frac{2433919}{180000} = 13\frac{93919}{180000}$

3.) a.) $5{\cdot}24\dot{7} : 3{\cdot}20\dot{9} = 5\frac{247-24}{900} : 3\frac{209-20}{900} =$

$5\frac{223}{900} : 3\frac{189}{900} = \frac{4723}{900} : \frac{2889}{900} = \frac{4723}{2889}$

b.) $8 : 2{\cdot}07\dot{3} = 8 : 2\frac{73-7}{900} = 8 : 2\frac{66}{900} = 8 : 2\frac{11}{150} =$

$= 8 : \frac{311}{150} = \frac{1200}{311} = 3\frac{267}{311}$

c.) $6{\cdot}3 : 2{\cdot}645 = 6\frac{3}{9} : 2\frac{645-6}{990} = 6\frac{1}{3} : 2\frac{639}{990} =$

$= 6\frac{1}{3} : 2\frac{71}{110} = \frac{19}{3} : \frac{291}{110} = \frac{2090}{873} = 2\frac{344}{873}$

Zaključni račun.

§33. I. Prosti zaključni račun.

1.) Za 3kg plaća se 6K
" 4" " " 8K
" 7" " "14K

2.) Šest puta toliko. $18{\cdot}5 \cdot 5 = 92{\cdot}5$ K

3.) Osam puta toliko. $3{\cdot}240 \cdot 8 = 25{\cdot}920$ Km

4.) Osam puta manje dana. $32 : 8 = 4$ dana.

5.) Za tri puta kraće vrijeme t.j. za 2 sata.

6.) Za pet puta manje dana tj. 9 dana.

7.) a.) 2 puta manje t.j. 2·5 m
b.) 2·5 " " " 2 m
c.) 1·3 " " " $5 : \frac{13}{10} = \frac{50}{13} = 3\frac{11}{13}$ m
d.) 0·8 " " " $5 : 0{\cdot}8 = 6{\cdot}25$ m

8.) a.) Za 7 puta kraće vrijeme t.j. za 4 dana
b.) " $3\frac{1}{2}$ " " " " " $28 : 3\frac{1}{2} = 8$ dana

9.) Izrađen u knjizi.

10.) 1 ha stoji $\frac{4320}{8} = 540$ K

11.) 13 puta toliko t.j. 65 dana.

12.) 15 puta manje tj. $\frac{480}{15} = 32$ puta

13.) Za 4 puta duže vrijeme tj. $16\frac{3}{4} \cdot 4 = 67$ sati

14.) $9 : 4{\cdot}5 = 2$ kg

B.

1.) Izrađen u knjizi.

2.) a.) Za 2 puta kraće vrijeme t.j. $8\frac{1}{2}$ dana
b.) " 4 " " " " $4\frac{1}{4}$ "
c.) " 3 " " " " $5\frac{2}{3}$ "
d.) " 3 " duže " " 5 dan

3.) a.) 2 puta više t.j. 24 pisara
b.) 4 " " " 48 "
c.) 2 " manje " 6 "

4.) a.) 3 puta toliko t.j. $540 \cdot 3 = 1620$
b.) 5 " " " $540 \cdot 5 = 2700$

5.) a.) 2 puta manje t.j. $72 \cdot 4 : 2 = 36 \cdot 2$ Km
b.) 3 " više " $72 \cdot 4 \cdot 3 = 217 \cdot 2$ Km

6.) 3 puta manje dana t.j. $12 : 3 = 4$ dana

7.) Ako 45 nedelja može da hrani 3 puta manje krava t.j. 3 krave. Po tome mora da proda 6 krava.

C

1.) Izvrsjen u knjizi.

2.) 1 m stoji $\frac{7 \cdot 20}{6} = 1 \cdot 20$ K
5 " " $12 \cdot 5 = 6 \cdot 00$ K
6·5 " " $12 \cdot 6 = 7 \cdot 80$ K
8 " " $12 \cdot 8 = 9 \cdot 60$ K
0·72 " " $12 \cdot 0 \cdot 72 = 0 \cdot 86$ K

3.) Za 1 K dobije se $27\frac{2}{5} : 73 = \frac{137}{5} : 73 = \frac{137}{365}$ m sukna
Za 285 K 285 puta toliko t.j: $\frac{137}{365} \cdot 285 = 106\frac{71}{73}$ m.

4.) 24 min = 1440 sek.
Za 24 min prevaliti će dakle zvuk $\frac{1440}{5}$ puta toliki put kao za 5 sek t.j: $1665 \cdot 288 =$
$= 479520$ m $= 479 \cdot 520$ Km

5.) Iz pregjašnjeg zadatka slijedi, da zvuk u svakoj sekundi prevali $\frac{1665}{5} =$
333 m. Za put od 7·585936 Km = 7585·936 m trebaće dakle $7585 \cdot 936 : 333 = 22 \cdot 78$ sek.

6.) Za 1 sat pregje $\frac{19}{5}$ Km. Za $7\frac{25}{60}$ sata pregje $\frac{19}{5} \cdot 7\frac{25}{60} = \frac{19}{5} \cdot 7\frac{5}{12} = \frac{19}{5} \cdot \frac{89}{12} = \frac{1691}{60} = 28\frac{11}{60}$ Km

7.) Za 1 Km treba $\frac{4}{13}$ sata. Za 45 Km 45 puta toliko.
$\frac{4}{13} \cdot 45 = \frac{180}{13} = 13\frac{11}{13}$ sata.

8.) Potrošiti će na godinu $\frac{365}{16}$ puta po 5 K sladora
$\frac{365}{16} \cdot 5 = 114\frac{1}{16}$ kg

9.) Za 1 ha treba $\frac{7}{13}$ sata.
Za 58 ha 58 puta toliko. $58 \cdot \frac{7}{13} = 31\frac{3}{13}$ sata.

10.) Dok se strožnji okrene 1 put okrene se prednji: $\frac{24}{18}$
" " " " 135 " " " 135 puta više
$135 \cdot \frac{24}{18} = 15 \cdot \frac{24}{2} = 15 \cdot 12 = 180$ puta.

11.) Razdijeljena svota iznosi $9 \cdot 12 = 108$ K
Ako ima 18 osoba dobije svaka $\frac{108}{18} = 6$ K

12.) Za 1 meh. centa plati $\frac{27}{24}$ K. Za 88 meh. centi 88 puta toliko: $\frac{27}{24} \cdot 88 = \frac{27}{3} \cdot 11 = 9 \cdot 11 = 99$ K

13.) Za 1 min. ističe $\frac{392}{18}$ l vode. Za 30 min 30 puta toliko: $\frac{392}{18} \cdot 30 = \frac{392}{3} \cdot 5 = 653\frac{1}{3}$ l

14.) Kupio je onaj bolje, koji je jeftinije platio:
Prvi je kupio 1 m robe za $\frac{10 \cdot 44}{4 \cdot 5} = 2 \cdot 32$ K
Drugi " " " " " $\frac{7 \cdot 30}{3 \cdot 12} = 2 \cdot 34$ K
Prvi je dakle kupio bolje.

15.) Dugu je mu $400 + 4 \cdot 6 \cdot 30 = 425 \cdot 20$ K

16.) " " $635 + 6 \cdot 35 \cdot 4 \cdot 5 = 663 \cdot 575$ K

17.) Da se posao sврši za 1 dan, trebalo bi raditi $9 \cdot 108$ sati na dan. Budući ga treba sврšiti za 81 dan treba raditi 81 put manje t.j $\frac{9 \cdot 108}{81} = \frac{108}{9} = 12$ sati.

18.) Po uputi u knjizi (31 radnik)

19.) Prvi radnik zasluži za 1 dan $\frac{42}{14} = 3$ K
Za pet dana zasluži dakle $5 \cdot 3 = 15$ K
Ako drugi radnik zaradi tu svotu

isto m za 6 dana zaradi on na dan $\frac{15}{6} = \frac{5}{2} = 2{\cdot}5$ K, a u 14 dana $14.2{\cdot}5 = 35$ K

20.) Po uputi u knjizi.

$\frac{36}{36} : \frac{5}{36} = \frac{36}{5} = 7\frac{1}{5}$ dana

21.) Dobiće $\frac{425}{250}$ puta po $19{\cdot}40$ K =

$= 1{\cdot}7.\ 19{\cdot}40 = 32{\cdot}98$ K

22.) Na 240 K = 2·4 stotine K dobio je $288 - 240 = 48$ K. Na 1 stotini dobio je dakle $\frac{48}{2{\cdot}4} = 20$ K

D

1. i 2. izraggjeni u knjizi.

3.) 3 4 radnika trebaju 15 dana
4 " " $3.15 = 45$ "

16 radnika = 4·4 radnika trebaju 4 puta manje nego 4 radnika t.j: $\frac{45}{4} = 11\frac{1}{4}$ dana

4.) Ako se radi 3. 12 dana, treba raditi 9h na dan
" " " 12 " " " 3.9^h " "
" " " 2. 12 " " " $\frac{3.9}{2} = \frac{27}{2} = 13\frac{1}{2}^h$ " "

5.) Za 15. 3K vozi 25 Km daleko
" 3K " $\frac{25}{15} = \frac{5}{3}$ Km "
" 14. 3K " $14. \frac{5}{3} = 23\frac{1}{3}$ Km "

Drugi način: Za manju cijenu vozić će manji put. Budući je u zadatku razlika u cijeni 3K (45–42 = 3) to će vozač voziti za onoliko km manje, koliko otpada na 3K. Na 3K pak otpad $\frac{5}{3}$ km. Po tome će vozač

odvesti teret samo na $25 - \frac{5}{3} = 23\frac{1}{3}$ km daljine.

6.) 5. 160 ljudi živi 3 mjeseca
160 " " $5.3 = 15$ "
4. 160 " " $\frac{15}{4} = 3\frac{3}{4}$ "

7.) $\frac{1}{2}$ kg = 500 g = 5. 100 g stoji 26 K
100 g " $\frac{26}{5}$ K
350 g = 3·5. 100 g " $3{\cdot}5.\ \frac{26}{5} = 0{\cdot}7.26 = 18{\cdot}2$ K

8.) 4. 372 čovjeka potroše na dan 1624 K
372 " " " " $\frac{1624}{4} = 406$ K
1860 = 5. 372 " " " " $5.406 = 2030$ K

Primjedba: U knjizi tiskarska pogrješka. Mjesto 1660 treba da stoji 1860

E

Zadaci izraggjeni u knjizi.

II. Složeni zaključni račun

1.) 15 konja treba za 8 dana 15 hl zobi
1 " " " 8 " $\frac{15}{15}$ " "
1 " " " 1 " $\frac{1}{8}$ " "
24 " " " 1 " $24. \frac{1}{8} = 3$ " "
24 " " " 9 " $9.3 = 27$ " "

2.) Za 9·6 K odveze vozač 180 kg 20 km daleko
" 1 K " " $\frac{180}{9{\cdot}6}$ " " "
" 1 K " " $\frac{180}{9{\cdot}6} \cdot 20$ " 1 Km "
" 12·8 K " " $\frac{180}{9{\cdot}6} \cdot 20 \cdot 12{\cdot}8$ kg 1 Km "
" 12·8 K " " $\frac{\frac{180}{9{\cdot}6} \cdot 20 \cdot 12{\cdot}8}{30} = 160$ kg 30 Km "

3.) 4320 m dug kanal kopa 60 radnika 48 dana

1 m " " " $\frac{60}{4320}$ " 48 "

1 m " " " $\frac{60}{4320} \cdot 48$ " 1 "

3480 m " " " $\frac{60}{4320} \cdot 48 \cdot 3480$ " 1 "

3480 m " " " $\frac{\frac{60}{4320} \cdot 48 \cdot 3480}{20} = 116$ " 20 dana

4.) 8 konja troši za 15 dana 20 hl

1 " " " 15 " $\frac{20}{8}$ "

1 " " " 1 " $\frac{20}{8} : 15 = \frac{1}{6}$ hl

1 " " " 7 " $7 \cdot \frac{1}{6} = 1\frac{1}{6}$ hl

5.) 6 kg pregje 60 m platna 1·5 m širine

1 " " $\frac{60}{6} = 10$ m " 1·5 " "

1 " " $10 \cdot 1{\cdot}5 = 15$ m " 1 " "

8 " " $15 \cdot 8 = 120$ m " 1 " "

8 " " $\frac{120}{1{\cdot}25} = 96$ m " 1·25 " "

6.) 32 retka po 45 slova 240 strana

1 " " 45·32 " 240 "

1 " " 45·32·240 " 1 "

36 " " $\frac{45 \cdot 32 \cdot 240}{36}$ " 1 "

36 " " $\frac{45 \cdot 32 \cdot 240}{36} : 200 = 48$ slova 200 strana

7.) 4 točka za $10\frac{1}{2}$ sati 1033·2 kg pšenice

1 " " $10\frac{1}{2}$ " $\frac{1033 \cdot 2}{4}$ " "

1 " " 1 " $\frac{1033 \cdot 2}{4} : 10{\cdot}5 = \frac{1033 \cdot 2}{4 \cdot 10{\cdot}5}$ kg "

3 " " 1 " $\frac{1033 \cdot 2}{4 \cdot 10{\cdot}5} \cdot 3$ kg pšenice

3 " " 14 " $\frac{1033 \cdot 2}{4 \cdot 10{\cdot}5} \cdot 3 \cdot 14 = 1033{\cdot}2$ kg "

8.) 36 kg pregje 112 m platna 84 cm širine

1 " " $\frac{112}{36}$ m " 84 " "

1 kg pregje $\frac{112}{36} \cdot 84$ m platna 1 cm širine

27 " " $\frac{112}{36} \cdot 84 \cdot 27$ m " 1 " "

27 " " $\frac{112}{36} \cdot 84 \cdot 27 : 70$ m = 100·8 m platna 70 cm šir.

9.) 12 m dužine 50 cm širine 40 K

1 " " 50 " " $\frac{40}{12}$ K

1 " " 1 " " $\frac{40}{12} : 50 = \frac{40}{12 \cdot 50}$ K

15 " " 1 " " $\frac{40}{12 \cdot 50} \cdot 15$ K

15 " " 60 " " $\frac{40}{12 \cdot 50} \cdot 15 \cdot 60 = 60$ K

10.) 10 radnika 8 dana 10 sati dnevno

10 " 1 " 10 " svrši $\frac{1}{8}$ posla

10 " 1 " 1 " " $\frac{1}{8} : 10 = \frac{1}{80}$ "

---

6 radnika 12 dana 8 sati dnevno

6 " 1 " 8 " " svrše $\frac{1}{12}$ posla

6 " 1 " 1 " " " $\frac{1}{12} : 8 = \frac{1}{96}$ "

Obe grupe svrše sloke za 1 sat

$\frac{1}{80} + \frac{1}{96} = \frac{6}{480} + \frac{5}{480} = \frac{11}{480}$ posla

Za koliko sati svršiti će $\frac{480}{480}$ posla tj. cio posao? Svršiti će ga za

$\frac{480}{480} : \frac{11}{480} = \frac{480}{11} = 43\frac{7}{11}$ sata. Budući da rade svaki dan $10\frac{3}{4}$ sata, to će cio posao biti u $43\frac{7}{11} : 10\frac{3}{4} = \frac{480}{11} : \frac{43}{4} = \frac{480}{11} \cdot \frac{4}{43} = \frac{1920}{473} = 4\frac{28}{473}$ dana gotov.

Primjedba: napustak u knjizi nije ispravan, jer ne odgovara zadatku. U zadatku se ne govori o „prvom i drugom" dijelu posla, nego o dvjema grupama radnika.

11.) 5 mornara za 3 dana 14 kg
1 " " 3 " $\frac{14}{5}$ "
1 " " 1 " $\frac{14}{5}:3=\frac{14}{15}$ kg
11 " " 1 " $\frac{14}{15}\cdot 11$ kg
11 " " 135 " $\frac{14}{15}\cdot 11\cdot 135=1386$ kg

12.) a.) 120 radnika 10 sati 36 dana
1 " 10 " 36.120 "
1 " 1 " 36.120.10 "
150 " 1 " $\frac{36.120.10}{150}$ "
150 " 9 " $\frac{36.120.10}{150}:9=32$ dana

b.) 36 dana 10 sati 120 radnika
1 " 10 " 36.120 "
1 " 1 " 36.120.10 "
240 " 1 " $\frac{36.120.10}{240}$ "
240 " 12 " $\frac{36.120.10}{240}:12=15$ radnika

c.) 120 radnika 36 dana 10 sati
1 " 36 " 10.120 "
1 " 1 " 10.120.36 "
96 " 1 " $\frac{10.120.36}{96}$ "
96 " 50 " $\frac{10.120.36}{96}:50=9$ sati

13.) 3 čovjeka za 4 dana 38·4 ha
1 " " 12 " 38·4 "
1 " " $\frac{12}{38\cdot 4}$ " 1 ha
7 ljudi " $\frac{12}{38\cdot 4}:7=\frac{12}{38\cdot 4\cdot 7}$ dana 1 ha
7 " " $\frac{12}{38\cdot 4\cdot 7}\cdot 472=21\frac{1}{14}$ " 472 ha

14.) 6 svjetiljaka $4\frac{1}{3}$ sata $40\frac{4}{9}$ K 40 večeri
1 " $4\frac{1}{3}$ " $40\frac{4}{9}$ K 6.40 "
1 " 1 " $40\frac{4}{9}$ K $6.40.4\frac{1}{3}$ "

1 svjetiljka 1 sat 1 K $\frac{6.40.4\frac{1}{3}}{40\frac{4}{9}}$ večeri
8 " 1 " 1 K $\frac{6.40.4\frac{1}{3}}{40\frac{4}{9}}\cdot 8=\frac{6.40.4\frac{1}{3}}{8.40\frac{4}{9}}$ "
8 " $6\frac{2}{3}$ h 1 K $\frac{6.40.4\frac{1}{3}}{8.40\frac{4}{9}}:6\frac{2}{3}=\frac{6.40.4\frac{1}{3}}{8.40\frac{4}{9}.6\frac{2}{3}}$ "
8 " $6\frac{2}{3}$ h $43\frac{1}{3}$ K $=\frac{6.40\ 4\frac{1}{3}}{8.40\frac{4}{9}.6\frac{2}{3}}\cdot 43\frac{1}{3}=20{\cdot}89$ večeri.

15.) 35 konj. sila 125 m za 1 sat
1 " " 125 " " 35 "
1 " " 1 " " $\frac{35}{125}$ "
156 " " 1 " " $\frac{35}{125}:156=\frac{35}{125.156}$ sati
156 " " 240 " " $\frac{35}{125.156}\cdot 240=\frac{28}{65}$ "

16.) Izračjen u knjizi

17.) 13·4 m dug 0·7 debeo 2·6 m visok 6097 opeka
1 " " 1 " " 1 " " $\frac{6097}{13\cdot 4.0\cdot 7.2\cdot 6}$ "
9·25 " " 0·8 " " 2·9 " " $\frac{6097}{13\cdot 4.0\cdot 7.2\cdot 6}\cdot 9{\cdot}25.0{\cdot}8.2{\cdot}9=$
$=5365$ opeka.

Omjeri i razmjeri

§34. Omjeri.

Vježbe

1.) a.) 6:2 = 3:1 ; b.) 10:18 = 5:9 ; c.) 16:12 = 4:3 ;
d.) 32:24 = 4:3 ; e.) 56:72 = 7:9 ; f.) 48:120 = 2:5 ;
g.) 60:84 = 5:7

2.) a.) $5\frac{2}{7}:3\frac{1}{7}=\frac{37}{7}:\frac{22}{7}=37:22$

b.) $1\frac{5}{8} : 2\frac{1}{6}$
$\frac{13}{8} : \frac{13}{6}$
$\frac{1}{4} : \frac{1}{3}$
$3 : 4$

c.) $\frac{2}{3} : 1$
$2 : 3$

d.) $10 : 3\frac{1}{3}$
$10 : \frac{10}{3}$
$1 : \frac{1}{3}$
$3 : 1$

e.) $6\frac{2}{3} : 3$
$\frac{20}{3} : 3$
$20 : 9$

f.) $2 : 4\frac{4}{5}$
$2 : \frac{24}{5}$
$1 : \frac{12}{5}$
$5 : 12$

g.) $15 : 8\frac{1}{3}$
$15 : \frac{25}{3}$
$3 : \frac{5}{3}$
$9 : 5$

h.) $9\frac{9}{10} : 10$
$\frac{99}{10} : 10$
$99 : 100$

i.) $\frac{1}{2} : \frac{3}{4}$
$1 : \frac{3}{2}$
$2 : 3$

k.) $\frac{2}{5} : \frac{8}{15}$
$2 : \frac{8}{3}$
$1 : \frac{4}{3}$
$3 : 4$

l.) $2\frac{1}{2} : 3\frac{1}{3}$
$\frac{5}{2} : \frac{10}{3}$
$\frac{1}{2} : \frac{2}{3}$
$\frac{3}{2} : 2$
$3 : 4$

m.) $2\frac{2}{3} : 1\frac{1}{4}$
$\frac{8}{3} : \frac{5}{4}$
$\frac{32}{3} : 5$
$32 : 15$

n.) $18\frac{1}{4} : 25\frac{3}{7}$
$\frac{73}{4} : \frac{178}{7}$
$\frac{571}{4} : 178$
$571 : 712$

o.) $75\frac{8}{9} : 46\frac{4}{5}$
$\frac{683}{9} : \frac{234}{5}$
$3415 : 2106$

p.) $0{\cdot}4 : 0{\cdot}5$
$4 : 5$

r.) $48 : 9{\cdot}6$
$48 : 96$
$1 : 2$

s.) $5{\cdot}05 : 25{\cdot}25$
$505 : 2525$
$1 : 5$

t.) $0{\cdot}04 : 0{\cdot}4$
$4 : 40$
$1 : 10$

u.) $1{\cdot}44 : 0{\cdot}24$
$144 : 24$
$6 : 1$

v.) $0{\cdot}0006 : 0{\cdot}00018$
$60 : 18$
$10 : 3$

3.) a.) $96 : 136$
$12 : 17$
$1 : \frac{17}{12}$

b.) $135 : 243$
$5 : 9$
$1 : \frac{9}{5}$

c.) $\frac{3}{5} : \frac{4}{5}$
$3 : 4$
$1 : \frac{4}{3}$

d.) $7\frac{1}{2} : 8\frac{1}{2}$
$\frac{15}{2} : \frac{17}{2}$
$1 : \frac{17}{15}$

e.) $4\frac{2}{3} : 5$
$\frac{14}{3} : 5$
$14 : 15$
$1 : \frac{15}{14}$

f.) $6 : 7\frac{1}{2}$
$6 : \frac{15}{2}$
$2 : \frac{5}{2}$
$1 : \frac{5}{4}$

g.) $\frac{5}{12} : \frac{1}{2}$
$\frac{5}{6} : 1$
$5 : 6$
$1 : \frac{6}{5}$

h.) $18\frac{1}{4} : 25\frac{3}{7}$
$\frac{73}{4} : \frac{178}{7}$
$\frac{571}{4} : 178$
$571 : 712$
$1 : \frac{712}{571}$

i.) $1{\cdot}56 : 0{\cdot}26$
$156 : 26$
$6 : 1$
$1 : \frac{1}{6}$

k.) $3{\cdot}42 : 4{\cdot}5$
$342 : 450$
$171 : 225$
$19 : 25$
$1 : \frac{25}{19}$

Žadoci.

1.) $24 : 48$
$1 : 2$

b.) $500 : 345$
$100 : 69$

c.) $2\frac{5}{12} : 3\frac{4}{12}$
$\frac{29}{12} : \frac{40}{12}$
$29 : 40$

d.) $100 : 85$
$20 : 17$

e.) $8\text{a} : 1000\text{a}$
$2 : 25$

f.) $15\text{g} : 0{\cdot}8\text{kg}$
$15\text{g} : 8\text{kg}$
$15\text{g} : 8000\text{g}$
$3 : 1600$

g.) $105\,\text{m}^2 : 205\,\text{m}^2$
$21 : 41$

2.) a.) $84 : 126$
$42 : 63$
$2 : 3$

b.) $126 : 84$
$3 : 2$

3.) $60 : 33\frac{1}{3}$

$60 : \frac{100}{3}$

$3 : \frac{5}{3}$

$9 : 5$

4.) $43\frac{3}{4} : 3\frac{3}{5}$

$\frac{175}{4} : \frac{18}{5}$

$875 : 72$

5.) $12 : 1$

6.) $3{\cdot}75 : 4{\cdot}77$

$375 : 477$

$125 : 159$

7.) 1 kg prve robe stoji $\frac{3 \cdot 75}{3} = 1{\cdot}25$ K

1 " druge " " $\frac{7 \cdot 5}{5} = 1{\cdot}50$ K

$1{\cdot}25 : 1{\cdot}50$

$125 : 150$

$5 : 6$

8.) $3{\cdot}80 : 0{\cdot}95$

$380 : 95$

$76 : 19$

$4 : 1$

9.) Izračunajen u knjizi.

10.) $9 : 12$

$3 : 4$

11.) a.) $34 : 51$ jer je brzina točka sa više zubaca manja, nego brzina točka sa manje zubaca. Brzina prvog točka odnosi se prema brzini drugog točka kao $\frac{1}{51} : \frac{1}{34}$ ili $34 : 51$

b.) $42 : 35$ ili $6 : 5$. Vidi a.)

12.) $4\frac{2}{3} : 6\frac{1}{3} = \frac{14}{3} : \frac{19}{3} = 14 : 19$

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§ 35. Razmjeri

1.) $18 : 2 = 63 : 7$

$2 \cdot 63 = 18 \cdot 7$

$126 = 126$

2.) $5 : 8 = 15 : 24$

$5 \cdot 24 = 8 \cdot 15$

$120 = 120$

3.) $4 : 3 = 9 : 7$

$28 \neq 27$

4.) $8 : 13 = 5 : 8$

$64 \neq 65$

5.) $0{\cdot}3 : 0{\cdot}7 = \frac{3}{4} : 1\frac{3}{4}$

$0{\cdot}7 \cdot \frac{3}{4} = 0{\cdot}3 \cdot 1\frac{3}{4}$

$\frac{21}{40} = \frac{21}{40}$

6.) $7 : 8 = 2\frac{5}{8} : 3$

$7 : 8 = \frac{21}{8} : 3$

$21 = 21$

7.) $8\frac{1}{4} : 10 = 4 : 4\frac{28}{33}$

$\frac{33}{4} : 10 = 4 : \frac{160}{33}$

$40 = 40$

8.) $3\frac{3}{4} : 10 = 7\frac{2}{3} : 24$

$\frac{15}{4} : 10 = \frac{23}{3} : 24$

$90 \neq \frac{230}{3}$

3.) $7\frac{3}{4} : 31 = 8 : x$

$\frac{31}{4} : 31 = 8 : x$

$\frac{1}{4} : 1 = 8 : x$

$1 : 4 = 8 : x$

$x = 32$

4.) $x : \frac{5}{8} = \frac{1}{3} : 2\frac{3}{4}$

$x : \frac{5}{8} = \frac{1}{3} : \frac{11}{4}$

$x : \frac{5}{2} = \frac{1}{3} : 11$

$x : 5 = \frac{1}{3} : 22$

$x : 5 = 1 : 66$

$x = \frac{5}{66}$

5.) $4\frac{1}{2} : x = 6 : \frac{2}{5}$

$\frac{9}{2} : x = 6 : \frac{2}{5}$

$\frac{3}{2} : x = 2 : \frac{2}{5}$

$\frac{3}{2} : x = 1 : \frac{1}{5}$

$\frac{3}{2} : x = 5 : 1$

$3 : x = 10 : 1$

$x = \frac{3}{10}$

6.) $8\frac{7}{9} : 5\frac{1}{6} = x : 4\frac{2}{3}$

$\frac{79}{9} : \frac{31}{6} = x : \frac{14}{3}$

$\frac{79}{9} : 31 = x : 28$

$79 : 279 = x : 28$

$x = \frac{28 \cdot 79}{279} = \frac{2212}{279}$

7.) $0{\cdot}4 : x = 6\frac{5}{12} : 13\frac{1}{2}$

$\frac{4}{9} : x = \frac{77}{12} : \frac{27}{2}$

$\frac{4}{9} : x = \frac{154}{12} : 27$

$\frac{2}{3} : x = \frac{77}{4} : 27$

$8 : x = 231 : 27$

$8 : x = 77 : 9$

$x = \frac{72}{77}$

8.) $7\frac{2}{3} : 0{\cdot}6 = 0{\cdot}6 : x$

$\frac{23}{3} : 0{\cdot}6 = 0{\cdot}6 : x$

$23 : 1{\cdot}8 = 0{\cdot}6 : x$

$x = \frac{1{\cdot}08}{23} = \frac{108}{2300}$

$x = \frac{27}{575}$

1.) $72 : 31 = 144 : x$

$1 : 31 = 2 : x$

2.) $x : 7\frac{1}{2} = 15\frac{1}{8} : 9\frac{1}{5}$

$x : \frac{15}{2} = \frac{121}{8} : \frac{46}{5}$

$x : \frac{75}{2} = \frac{121}{8} : 46$

$x : 75 = \frac{121}{8} : 92$

$x : 75 = 121 : 736$

3.) $6 : 3\frac{3}{4} = x : 9\frac{1}{2}$

$6 : \frac{15}{4} = x : \frac{19}{2}$

$4 : 5 = x : 19$

4.) $\frac{1}{4} : \frac{2}{3} = \frac{5}{8} : x$

$3 : 8 = \frac{5}{8} : x$

$3 : 1 = 5 : x$

5.) $2\frac{3}{8} : x = 8\frac{4}{9} : 13\frac{5}{18}$

$\frac{19}{8} : x = \frac{76}{9} : \frac{239}{18}$

$\frac{19}{8} : x = 76 : \frac{239}{2}$

$\frac{1}{8} : x = 4 : \frac{239}{2}$

$1 : x = 64 : 239.$

6.) $x : 18\frac{5}{12} = 9\frac{4}{5} : 97\frac{13}{60}$

$x : \frac{221}{12} = \frac{49}{5} : \frac{5833}{60}$

$x : 221 = \frac{49}{5} : \frac{5833}{5}$

$x : 221 = 49 : 5833$

7.) $5\frac{1}{5} : 6\frac{2}{9} = 18 : x$

$\frac{26}{5} : \frac{56}{9} = 18 : x$

$13 : \frac{56}{9} = 45 : x$

$13 : 5\frac{\overline{6}}{9} = 5^{\overline{}} : x$

8.) $1\frac{5}{9} : x = 3\frac{13}{25} : 4\frac{4}{5}$

$\frac{14}{9} : x = \frac{88}{25} : \frac{24}{5}$

$\frac{14}{9} : x = 11 : 15^{\overline{}}$

$14 : x = 99 : 15^{\overline{}}$

$14 : x = 33 : 5^{\overline{}}$

9.) $x : 0{\cdot}7 = 3{\cdot}35 : 2{\cdot}5^{\overline{}}$

$x : 7 = 3{\cdot}35^{\overline{}} : 25^{\overline{}}$

$x : 7 = 0{\cdot}67 : 5^{\overline{}}$

$x : 7 = 67 : 500$

10.) $8{\cdot}2\dot{7} : 3{\cdot}7083\dot{3} = x : 20\frac{5}{8}$

$8\frac{27-2}{90} : 3\frac{7083-70}{9000} = x : \frac{165}{8}$

$8\frac{25}{90} : 3\frac{6375}{9000} = x : \frac{165}{8}$

$\frac{745}{90} : \frac{33375}{9000} = x : \frac{165}{8}$

$745 : \frac{33375}{100} = x : \frac{165}{8}$

$74500 : 6675 = x : \frac{33}{8}$

$74500 : 2225 = x : \frac{11}{8}$

$2980 : 89 = x : \frac{11}{8}$

$745 : 178 = x : 11$

11.) $24 : 72 = 13 : x$

$1 : 3 = 13 : x$

$x = 39$

12.) $7 : x = 63 : 16$

$1 : x = 9 : 16$

$x = \frac{16}{9}$

13.) $55^{\overline{}} : x = 12\frac{1}{4} : 40$

$55^{\overline{}} : x = \frac{49}{4} : 40$

$55^{\overline{}} : x = 49 : 160$

$x = \frac{160 \cdot 55^{\overline{}}}{49} = \frac{8800}{49}$

14.) $6\frac{2}{3} : 4\frac{1}{3} = 20 : x$

$\frac{20}{3} : \frac{13}{3} = 20 : x$

$1 : 13 = 1 : x$

$x = 13$

15.) $3\frac{1}{4} : 3\frac{1}{2} = 10\frac{4}{5} : x$

$\frac{13}{4} : \frac{7}{2} = \frac{54}{5} : x$

$13 : 14 = \frac{54}{5} : x$

$x = \frac{54 \cdot 14}{65} = \frac{756}{65}$

16.) $5 : 5\frac{1}{3} = 2\frac{1}{2} : x$

$5 : \frac{16}{3} = \frac{5}{2} : x$

$1 : \frac{16}{3} = \frac{1}{2} : x$

$3 : 8 = 1 : x$

$x = \frac{8}{3}$

17.) $2\frac{1}{2} : x = 4\frac{5}{6} : 8\frac{2}{3}$

$\frac{5}{2} : x = \frac{29}{6} : \frac{26}{3}$

$5 : x = \frac{29}{3} : \frac{26}{3}$

$5 : x = 29 : 26$

$x = \frac{130}{29}$

18.) $x : 12\frac{1}{2} = 19\frac{1}{6} : 17\frac{1}{2}$

$x : \frac{25}{2} = \frac{115}{6} : \frac{35}{2}$

$x : 5^{\overline{}} = \frac{115}{6} : 7$

$x : 5^{\overline{}} = 115 : 42$

$x = \frac{575^{\overline{}}}{42}$

19.) $0{\cdot}25 : 0{\cdot}75 = 1{\cdot}4 : x$

$25^{\overline{}} : 75^{\overline{}} = 1{\cdot}4 : x$

$1 : 3 = 1{\cdot}4 : x$

$10 : 3 = 14 : x$

$5^{\overline{}} : 3 = 7 : x$

$x = \frac{21}{5}$

20.) $15{\cdot}24 : x = 4 : 12{\cdot}4$

$3{\cdot}81 : x = 1 : 12{\cdot}4$

$x = 3{\cdot}81 \cdot 12{\cdot}4 = 47{\cdot}244$

§ 36. Prosto pravilo trojno.

1.) 24 ↑ 4 ↓

x ↑ 2 ↓

$x : 24 = 4 : 2$

$x = 48$ podnika

2.) 12 ↑ 10 ↑

x ↑ 24 ↑

$x : 12 = 24 : 10$

$x = 28{\cdot}8\,K$

3.) a.) 16 ↑ 0·50 ↓

x ↑ 1 ↓

$x : 16 = 0{\cdot}5^{\overline{}} : 1$

$x = 8\,m$

b.) 16 ↑ 0·50 ↓

x ↑ 0·75 ↓

$x : 16 = 0{\cdot}50 : 0{\cdot}75^{\overline{}}$

$x = 10\frac{2}{3}\,m$

4.) Ostatok je $135^{\overline{}} - 75^{\overline{}} = 60\,kg$

135 ↑ 24675 ↑

60 ↑ x ↑

$x : 246{\cdot}75^{\overline{}} = 60 : 135$

$x = \frac{329}{3} = 109\frac{2}{3}\,K$

5.) Za 37·52 K moći će se kupiti 100-72=28 kg robe

28 ↑ 37·52 ↑
42·5 ↑ x ↑

x = 1·34. 42·5 = 56·95 K

x : 37·52 = 42·5 : 28

6.) 12 mjeseci 150 K
5 " ↑ x ↑
x : 150 = 5 : 12
x = 62·5 K

7.) 1 sat 8 hl
x " ↑ 60 hl ↑
x : 1 = 60 : 8
x = 7·5 sati

8.) 18 kosaca 4 dana
12 " ↓ x " ↑
x : 4 = 18 : 12
x = 6 dana

9.) 12 sati dnevno 15 dana
10 " " ↓ x " ↑
x : 15 = 12 : 10
x = 18 dana

10.) 12 mjeseci 1080 K
8 " ↑ x K ↑
x : 1080 = 8 : 12
x = 720

11.) a.) 100 K 4·50 K
1258 K ↑ x ↑
x : 4·5 = 1258 : 100
x = 56·61

11.) b.) Za dvije godine traba da plati B A-u na svakih 100 K 2 puta više, nego za 1g, tj. 9 K

100 ↑ 9 ↑
1258 ↑ x ↑
x : 9 = 1258 : 100
x = 113·22 K

12.) 6 dana po 35
8 " ↓ " x ↑
x : 35 = 6 : 8
x = 26·250 km

13.) 18 min 396 l
30 " ↑ x ↑
x : 396 = 30 : 18
x = 660 l

14.) 7 sati dnevno 48 dana
12 " " ↓ x " ↑
x : 48 = 7 : 12
x = 28 dana

15.) a.) 50 redova 24 tabka
40 " ↓ x " ↑
x : 24 = 50 : 40
x = 30 tabaka

b.) 50 redova 24 tabka
x " ↑ 25 " ↓
x : 50 = 24 : 25
x = 48 redova

16.) a.) 12 mjeseci 336 K
7 " ↑ x ↑
x : 336 = 7 : 12
x = 196

b.) 12 mjeseci 336 K
x " ↑ 126 K ↑
x : 12 = 126 : 336
x = 4·5 mjeseci

17.) Po upustu u knjizi.

18.) 32 radnika radili bi još 18 dana
24 ↓ " radiće " x " ↑
x : 18 = 32 : 24
x = 24 dana. Posao će ukupno trajati 6 + 24 = 30 dana.

19.) 10 radnika radili bi još 14 dana
4 ↓ " radiće " x " ↑
x : 14 = 10 : 4 x = 35 dana
Posao će biti gotov za 4 + 35 = 39 dana.

20.) 30 ljudi popči je posao za 12 nedelja
30 " " za 6 nedelja ½ posla
45 " ↑ " " 6 " x " ↑
x : ½ = 45 : 30
x = ¾ posla. 45 radnika ologotovilo je dakle za 6 nedelja ¾ posla. Ostaje ¼ posla neodvršena. Ako 45 radnika sopči ¾ posla za 6 nedelja, sopće ¼ za 2 nedelje.
45 radnika za 2 nedelje sopči i ostatak
x ↑ " " 3 ↓ " " "

$x : 45 = 2 : 3 \qquad x = 30$ radnika

22.) Da se nije dužina otvora promijenila, trebao bi da nabavi još 1500 m^3 po 80 cm dužine.

$$\begin{array}{cc} \uparrow 1500 & \downarrow 80 \\ x & \downarrow 64 \end{array} \qquad x = 1875$$

$x : 1500 = 80 : 64$

23.) Za 200 ovaca bilo bi još za 3 mjes. hrane
" 360 ↓ " bika " " x " ↑ "

$x : 3 = 200 : 360 \qquad x = 1\frac{2}{3}$ mjeseca

24.) 10 ljudi svrši za 15 dana cio posao
10 " " " 5 " $\frac{1}{3}$ posla
6 ↑ " " " 5 " ↑ x "

$x : \frac{1}{3} = 6 : 10$

$x = \frac{1}{5}$ posla obavi 6 radnika za 5 dana
6 radnika za 5 dana obavi $\frac{1}{5}$ posla
1 " " 1 " " $\frac{1}{5 \cdot 5 \cdot 6} = \frac{1}{150}$ posla
8 " " 3 " " $\frac{24}{150} = \frac{4}{25}$ posla

Karol napokon ulogju zadnja 4 čovjeka
svršeno je $\frac{1}{5} + \frac{4}{25} = \frac{9}{25}$ posla. Pita se,
kada će 12 radnika svršiti $\frac{16}{25}$ posla,
ako 10 ljudi svrši za 15 dana cio posao.
10 ljudi svrši za 15 dana 1 posao t.j. cio posao
10 " " " x ↑ " $\frac{16}{25}$ ↑

$x : 15 = \frac{16}{25} : 1 \qquad x = \frac{48}{5}$ dana

10 ljudi svrši $\frac{16}{25}$ posla za $\frac{48}{5}$ dana
12 " ↓ " $\frac{16}{25}$ " " ↑ x "

$x : \frac{48}{5} = 10 : 12 \qquad x = 8$ dana

Posao će dakle biti gotov u $5 + 3 + 8 =$
$= 16$ dana.

25.) Konj prevali u isto vrijeme $\frac{5}{12}$ puta
što ga lokomotiva prevali, t.j. konj
treba za isti put $\frac{12}{5}$ puta više vremena
nego lokomotiva, a lokomotiva treba
$\frac{5}{12}$ onog vremena što ga treba konj za
isti put. Ako konj treba 8 h treba loko-
motiva $8 \cdot \frac{5}{12} = 3\frac{1}{3}$ sata.

26.) Po uputi u knjizi.

27.) Na 1000 dijelova težine fonte dolazi 900
dijelova težine čista srebra
Na x ↑ dijelova težine for. dolazi $\frac{1}{9}$ kg. ↑

$x : 1000 = \frac{1}{90} : 900$

$x = \frac{1}{81}$ kg $= 12{,}3456$ g = težina jedne fonte

28.) Za drugu polovicu trebalo bi 12 radn. 20 dana
" " " " " 15 " ↓ x " ↑

$x : 20 = 12 : 15$

$x = 16$ dana

29.) 15 l vode oladne 16 dm^3 leda
720 l " ↑ " x " ↑ "

$x : 16 = 720 : 15 \qquad x = 768$ dm^3 leda

30.) – 37.) po uputi za zad. 30. Rezultati
u knjizi.

38.) Sa $8\frac{3}{4}$ pomnožen ulje 140
" x ↑ " " 32 ↑

$x : 8\frac{3}{4} = 32 : 140$

$x : \frac{1}{4} = 32 : 4$

$x = 2$

39.) $6\frac{3}{8}$ pomnožen sa $7\frac{5}{9}$ daje jedan produkt
$\downarrow 5\frac{1}{2}$ " " x ↑ " isto "

$x : 7\frac{5}{9} = 6\frac{3}{8} : 5\frac{1}{2}$ $x = 8\frac{25}{33}$

40.) 130 zubaca 198 okretaja
↑ x " ↓ 78 "

$x : 130 = 198 : 78$
$x = 330$ zubaca

Neupravno, jer se točak okreće polaganije, ako ima više zubaca

41.) 6000 ljudi može živjeti 16 nedelja
↑ x " " " ↓ 20 "

$x : 6000 = 16 : 20$ $x = 4800$ ljudi
Ostali t.j.: 1200 ljudi mora ostaviti tvrđavu.
42. i 43. po uputi u knjizi.
44.) u 3 dijela 5·60 K
↑ u 5 " x ↑

$x : 5{\cdot}60 = 5 : 3$ $x = 9\frac{1}{3}$ K

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§37. Procentni računi.

1.) a.) 2% od 400 = 8
b.) 3% " 500 = 15
c.) 4% " 620 = 4·62 = 24·8
d.) $3\frac{1}{2}$% " 825 = 3·5·8·25 = 28·875
e.) $5\frac{3}{4}$% " 2345 = 5·75 . 23·45 = 134·8375
f.) 7% " 5038 = 7. 50·38 = 352·66
g.) 6% " 7300 = 6. 7·3 = 43·8
h.) $4\frac{2}{5}$‰ od 975 = 4·6. 0·975 = 4·485
2.) a.) 50% b.) 25% c.) 20% d.) 75%
e.) 875‰ = 87·5%

3.) a.) 3% od 200 = 6; broj je 206
3% " 360 = 10·8; " " 370·8
3% " 500 = 15; " " 515
3% " 1800 = 54; " " 1854
b.) 4% od 300 = 12; broj je 288
4% " 750 = 30; " " 720
4% " 820 = 32·8; " " 787·2
4% " 900 = 36; " " 864
4.) 4% = $\frac{1}{25}$; 5% = $\frac{1}{20}$; 10% = $\frac{1}{10}$; 20% = $\frac{1}{5}$
25% = $\frac{1}{4}$; 50% = $\frac{1}{2}$
4a.) a.) 328 – 5% od 328 = 328 – 5. 3·28 = 328 – 16·4 = 311·6 kg
b.) Tara iznosi 5% od 328 = 5. 3·28 = 16·4
5.) a.) Dobitak = 8% od 485 K = 8. 4·85 = 38·80 K
b.) po uputi u knjizi.
6.) a.) Pripravnina = $2\frac{1}{2}$% od 3258 K = 2·5. 32·58 =
= 81·45 K. b.) Ostaje mu čisto 3258 – pripravnina = 3258 – 81·45 = 3176·55 K
7.) a.) Povišica = 15% od 28 = 15. 0·28 = 4·20 K
b.) Povišena nedeljna zaslužba = 28 + 4·20 = 32·20 K
8.) Roba stoji u vremu 2486·60 + 5% od 2486·60 =
= 2486·60 + 5. 24·866 = 2610·93 K
9.) Platiće 518 – $7\frac{1}{2}$% od 518 = 518 – 7·5. 5·18 =
= 479·15
10.) a.) Dobio je u vremu 1656·80 + 20% od 1656·80 =
= 1656·80 + 20. 16·568 = 1988·16
b.) Prodavao je 1 kg po $\frac{1988{\cdot}16}{872}$ = 2·28 K
11.) Muške djece bilo je 52% od 825 =
52. 8·25 = 429. Ženske djece bilo je
825 – 429 = 396.

12.) 100 : 125
18360 : x
x = 125 · 183·6 = 22950
x : 125 = 18360 : 100

13.) Platiti će u premu 6913·56 + 2¼% od 6913·56 =
= 6913·56 + 2·25 · 69·1356 = 7069·12 K

14.) Račun iznosi: 8563 + 218 + 2% od 8563 =
= 8781 + 2 · 85·63 = 8952·26

15.) a.) 0·5 · 6·18 = 3·09 ; b.) 0·5 · 3·2746 = 1·6373
c.) 0·5 · 57·3686 = 28·6843

16.) 4‰ = 0·4%
a.) 0·4 · 7·2 = 2·88 ; b.) 0·4 · 38·4575 = 15·383

17.) 36·7% od 1031 = 36·7 · 10·31 = 378·377 kg soli

18.) Roba će stajati: 6952·84 + 178·72 + 1·75% od
6952·84 = 7253·23 K

19.) Cijena robe ..... 3793·47 K
0·5% senzarije ..... 18·97 K
1·25% provizije ..... 47·42 K
Svota, koju će trgovac platiti 3859·86 K

20.) Cijena robe ..... 369·20 K
vožarina ..... 17·34 K
Drugi troškovi 5% od 369·20 ..... 18·46 K
Sveukupni troškovi ..... 405·00 K
Dobitak 34% od 405·00 K ..... 137·70 K
Trgovac mora da proda robu za .. 542·70 K
1 kg mora da prodaje za: $\frac{542·70}{100}$ = 5·43 K

21.) Rabat iznosi: 2·5 · 54·3678 = 135·92 K

22.) Netto težina ulja iznosi 90% od 2583 =
= 2324·700 kg.

Nastavak na drugoj str.

Za 100 kg plati 136 K sa ½% rabata = 99½% od 136 K = 135·32 K
Za 2324·7 kg " x
x : 135·32 = 2324·7 : 100 x = 852·40 K
x = 3145·78 K

23.) Na svakih 100 K ima 33⅓% popusta 1. j. plati 66⅔ K
100 : 66⅔
1278·60 : x
x = 852·40 K
x : 66⅔ = 1278·60 : 100

24.) 4¼% od 8540 = 4·25 · 85·40 = 362·95 K

25.) 1⅓% " 30560 = $\frac{4}{3}$ · 305·60 = 407·47 K

26.) 1¼% " 85000 = 1·25 · 850 = 1062·50 K

27.) 100 : 106 K
11·29 : x
x = 11·97 K = vrijednost dukata.
x : 106 = 11·29 : 100

28.) Morati će se platiti za 23½% od 206·75 K više u srebrenom novcu.
100 : 123·5
206·75 : x
x = 255·34 K u srebru
x : 123·5 = 206·75 : 100

29.) 21% od 850 = 21 · 8·5 = 178·5 m³ kisika.

30.) Izvagjen u knjizi.

31.) a.) 300 : 24
100 : x
x : 24 = 100 : 300
x = 8

b.) 4000 : 120
100 : x
x : 120 = 100 : 4000
x = 3

c.) 4500 : 135
100 : x
x : 135 = 100 : 4500
x = 3

d.) 612 : 30⅗
100 : x
x : 30⅗ = 100 : 612
x = 5

e.) 3·35 ↑ 0·207 ↑
100 ↑ x ↑ x = 6

x · 0·207 = 100 : 3·35

32.) 352 ↑ 264 ↑
100 ↑ x ↑

x : 264 = 100 : 352

x = 75

33.) Ima dobitka 898·16 - 824 = 74·16

824 ↑ 74·16 ↑
100 ↑ x ↑

x : 74·16 = 100 : 824

x = 9

34.) Jubitka ima
723 - 676·85 = 46·15

723 ↑ 46·15 ↑
100 ↑ x ↑

x : 46·15 = 100 : 723

x = 6·383 %

35.) Dobitak iznosi
60 - 48 = 12 K

48 ↑ 12 ↑
100 ↑ x ↑

x : 12 = 100 : 48

x = 25 %

36.) Šara iznosi 815 - 749·8 = 65·2 kg

815 ↑ 65·2 ↑
100 ↑ x ↑

x : 65·2 = 100 : 815

x = 8 %

37.) 3600 ↑ 864 ↑
100 ↑ x ↑

x : 864 = 100 : 3600

x = 24 %

38.) Rabat iznosi 9639 - 9253·44 = 385·56 K

9639 ↑ 385·56 ↑
100 ↑ x ↑

x : 385·56 = 100 : 9639

x = 4 %

39.) 10 %

40.) Plati oje za probu 5·27. 87·24 = 459·75 K
Troškovi iznose ... 25·14 K
Trgovca stoji proba ... 484·89 K
Trgovac dobije za svu probu 527. 1·17 = 616·59 K
Dobit je dakle na cijeloj robi: 616·59 - 484·89 =
= 131·70 K. /: Nastavak na drugoj str. :/

484·89 ↑ 131·70 ↑
100 ↑ x ↑ x = 27·16 %

x : 131·70 = 100 : 484·89

41.) Prirast je 45600 - 33884 = 11716

33884 ↑ 11716 ↑
100 ↑ x ↑ x = 34·57 %

x : 11716 = 100 : 33844

42.) 936 ↑ 22·74 ↑
100 ↑ x ↑ x = 2·429 %

x : 22·74 = 100 : 936

43.) Za 1475 K zlata plaćase 1829 K srebra
100 K ↑ " " x " ↑ "

x : 1829 = 100 : 1475 x = 124

Ažija = 124 - 100 = 24 %

44.) 100 ↑ 8 ↑
x ↑ 32 ↑

x : 100 = 32·8

x = 400

45.)a.) 100 ↑ 5 ↑
x ↑ 617·5 ↑

x : 100 = 617·5 : 5

x = 12350

45.)b.) 100 ↑ 8·5 ↑
x ↑ 86·7 ↑

x : 100 = 86·7 : 8·5

x = 1020

c.) 100 ↑ 7·75 ↑
x ↑ 620 ↑

x : 100 = 620 : 7·75

x = 8000

46.) 100 ↑ 5 ↑
x ↑ 1096 ↑

x : 100 = 1096 : 5

x = 21920

47.) 100 ↑ 8 ↑
x ↑ 400 ↑

x : 100 = 400 : 8

x = 5000

48.) 100 ↑ 2 ↑
x ↑ 104 ↑ x = 5200

x : 100 = 104 : 2

49.) 100 ↑ 5
x ↑ 4720 ↑
x:100 = 4720:5
x = 94400 kg

50.) 100 ↑ 24
x ↑ 528 ↑
x:100 = 528:24
x = 2200

51.) a.) 100 ↑ 104
x ↑ 2236 ↑
x:100 = 2236:104
x = 2150

b.) 100 ↑ 106
x ↑ 588·3 ↑
x:100 = 588·3:106
x = 555

c.) 100 ↑ 102·5
x ↑ 353·625 ↑
x:100 = 353·625:102·5
x = 345

d.) 100 ↑ 105·5
x ↑ 1301·87 ↑
x:100 = 1301·87:105·5
x = 1234

52., 53. i 54. izvrsjeni u knjizi.

55.) Na 100K platio je 96
" x " " " 208·58 ↑
x:100 = 208·58:96 x = 217·27K

56.) 100 ↑ 112
x ↑ 3500 ↑
x:100 = 3500:112
x = 3125K

57.) 100 ↑ 100·5
x ↑ 2653·40 ↑
x:100 = 2653·40:100·5
x = 2640·20

58.) Treba najprije izračunati, koliko je ljudi prije bilo.
100 ↑ 85
x ↑ 16840 ↑
x:100 = 16840:85
x = 19811
Umrlo ih je dakle
19811 - 16840 = 2971 osoba

59.) Treba najprije izracunati vrijednost robe 100 ↑ 90
x ↑ 150 ↑
x:100 = 150:90
x = 166 2/3 K = vrijed. robe.

100 ↑ 108
166 2/3 ↑ x ↑
x:108 = 166 2/3 : 100
x = 180K

Robu treba da proda za 180K da dobije 8%

60.) 100 ↑ 112
x ↑ 336 ↑
x:100 = 336:112
x = 300K

61.) Treba izračunati, koliko vrijedi 1hl
100 ↑ 104
x ↑ 60 ↑
x:100 = 60:104
x = 57 9/13

Što prodaje 1hl za 3 3/4 K jeftinije, to ga prodaje za 60 - 3 3/4 = 56 1/4 K, Gubi dakle i to kod svakog hektolitra 57 9/13 - 56 1/4 = 1 23/52 K

57 9/13 ↑ 1 23/52
100 ↑ x ↑
x:1 23/52 = 100:57 9/13
x = 2·5%

62.) Treba izračunati koliko roba vrijedi.
100 ↑ 94
x ↑ 940
x = 1000K vrijedi robe

100 ↑ 104
1000 ↑ x
x = 1040 K

Za 1040K valja robu prodati, da se dobije 4%.

63.) Zaslužio je u svemu 50h = 1/5 od 2·5K + j. 20%

64.) 100 ↑ 108
x ↑ 81 ↑
x:100 = 81:108
x = 75 l vina

65.) Ona 42 zdrava djeteta bila su dakle
100 - 12·5 = 87·5% sve djece

/: Nastavak na drugoj str. :/

100 ↑ 87.5
x ↑ 42 ↑ x = 48 djece

x : 100 = 42 : 87.5

66.) Treba izračunati koliko alkohola ima u 180 l špirita. Ima 85% od 180 = 153 l alkohola. Kad se doda onim 180 l još 20 l vode, biti će 200 l tekućine, u kojoj ima 153 l alkohola.

200 ↑ 153 ↑
100 ↑ x ↑ x = 76.5%

67.) Dobio je 3.250 − 600 = 750 − 600 = 150 K

600 ↑ 150 ↑
100 ↑ x ↑ x = 25%

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§ 38. Kamatni račun.

A. Proračunavanje kamata.

1.) Izračunajte u knjizi.

2.) a.) $83.3\frac{1}{2} = 83.\frac{7}{2} = 290.5\,K$

b.) $83.4\frac{5}{12} = 83.\frac{53}{12} = 366\frac{7}{12}\,K$

c.) $83.7\frac{25}{36} = 83.\frac{277}{36} = 638\frac{23}{36}\,K$

3.) a.) $3\frac{3}{4}$ g 461·25 K
$5\frac{1}{2}$ g ↑ x ↑
x : 461·25 = $5\frac{1}{2} : 3\frac{3}{4}$
x = 676·50 K

b.) $3\frac{3}{4}$ g 461·25 K
$6\frac{1}{3}$ g ↑ x ↑
x : 461·25 = $6\frac{1}{3} : 3\frac{3}{4}$
x = 779·00 K

4.) a.) 7·5% 64 K
1% ↑ x ↑
x : 64 = 1 : 7·5
x = 8·53 K

b.) 7·5% 64 K ↑
3% ↑ x
x : 64 = 3 : 7·5
x = 25·6

4.) c.) 7·5% 64 ↑
8·25% ↑ x ↑ x = 70·4 K
x : 64 = 8·25 : 7·5

5.) 3600 K donese za 1 g $\frac{540}{3}$ = 180 K kamata
5800 K ↑ " " " x ↑ "
x : 180 = 5800 : 3600 x = 290 K

Za 5 g i 7 mjeseci donese 5800 K $5\frac{7}{12} \cdot 290 = 1619\frac{1}{6}$ K kamata.

6.) Izračunajte u knjizi.

7.) a.) Kamate = $\frac{2364 \cdot 80 \cdot 4 \cdot 75 \cdot 3}{100} = 336 \cdot 98$ K

b.) " = $\frac{5427 \cdot 58 \cdot 5 \cdot 5 \cdot 2\frac{1}{3}}{100} = 696 \cdot 54$ K

c.) " = $\frac{13467 \cdot 6 \cdot 25 \cdot 3}{100} = 2525 \cdot 06$ K

8.) Kamate = $\frac{5238 \cdot 5 \cdot 2 \cdot 75}{100} = 720 \cdot 23$ K

" = $\frac{4855 \cdot 35 \cdot 4 \cdot 75 \cdot 3\frac{5}{12}}{100} = 787 \cdot 98$ K

Druga glavnica nosi za 787·98 − 720·23 = 67·75 K više kamata.

9.) Posjednik će platiti: $17000 + \frac{17000 \cdot 5 \cdot 5 \cdot 3}{100} = 19805$ K.

10.) Kamate = $\frac{6285 \cdot 4 \cdot \frac{8}{12}}{100} = 167 \cdot 60$ K

11.) " = $\frac{3856 \cdot 0 \cdot 75 \cdot 8}{100} = 231 \cdot 36$ K

12.) Kamate = $\frac{840 \cdot 30 \cdot 6 \cdot 2 \cdot 75}{100} = 138 \cdot 65$ K

$\frac{1}{2}$% mjesečno = $\frac{12}{2}$% = 6% godišnje

13.) Kamate = $\frac{750 \cdot 4 \cdot \frac{5}{12}}{100} = 12 \cdot 50$ K

" = $\frac{860 \cdot 5 \cdot 0 \cdot 5}{100} = 21 \cdot 50$ K

Kamate = $\frac{950 \cdot 4 \cdot 75 \cdot \frac{7}{12}}{100} = 26{\cdot}31\,K$

" = $\frac{780 \cdot 5 \cdot 5 \cdot 0{\cdot}75}{100} = 32{\cdot}18\,K$

Ukupne kamate = 92·49 K

14.) a.) Kamate = $\frac{3750 \cdot 4 \cdot 75 \cdot \frac{35}{365}}{100} = 17{\cdot}08$

b.) " = $\frac{11680 \cdot 4 \cdot 5 \cdot \frac{65}{365}}{100} = 93{\cdot}60$

15.) a.) Kamate = $\frac{3552 \cdot 5 \cdot \frac{69}{365}}{100} = 33{\cdot}58$

b.) " = $\frac{8473 \cdot 5 \cdot 5 \cdot \frac{40}{365}}{100} = 51{\cdot}07$

c.) " = $\frac{9500 \cdot 6 \cdot \frac{75}{365}}{100} = 117{\cdot}12$

16.) 100 ↑ 106
x ↑ 795 ↑ x = 750 K

x : 100 = 795 : 106

17.) 100 K uz 4% do nos. za $\frac{1}{2}$ g 2 K ... 102
x ↑ " " 4590 ↑

x : 100 = 4590 : 102 x = 4500

Platio je u inne kamata 4590 - 4500 = 90 K

B. Proračun nova nje glavnice.

1.) Izraqjen u knjizi.

2.) a.) 100 6·75
x ↑ 324 ↑

x : 100 = 324 : 6·75

x = 4800

b.) 100 6·75
x ↑ 10·80 ↑

x : 100 = 10·80 : 6·75

x = 160

c.) 100 6·75
x ↑ 54 ↑

x : 100 = 54 : 6·75

x = 800

3.) Izraqjen u knjizi.

4.) a.) Glavnica = $\frac{100 \cdot 375 \cdot 30}{3 \cdot 4 \cdot 5} = 2780\,K$

b.) " = $\frac{100 \cdot 617 \cdot 68}{5 \cdot 4\frac{2}{3}} = 2647{\cdot}20\,K$

c.) " = $\frac{100 \cdot 1675}{5 \cdot 4 \cdot 0{\cdot}8} = 34166{\cdot}64\,K$

d.) " = $\frac{100 \cdot 1476}{4 \cdot 3\frac{5}{12}} = 10800{\cdot}00\,K$

e.) " = $\frac{100 \cdot 950}{9 \cdot 0 \cdot 5} = 21111{\cdot}19\,K$

5.) Može se pomnožiti za glavnicu, koja uz 5% nosi godišnje 1875 K

100 ↑ 5
x ↑ 1875 ↑

x : 100 = 1875 : 5

x = 37500

6.) Izraqjen u knjizi.

7.) 100 K naraste uz 4% za 3 g. na 112 K
x K ↑ " " " " " 4200 K ↑

x : 100 = 4200 : 112 x = 3750 K

b.) 100 K naraste uz 4% za $\frac{1}{12}$ g na $100\frac{1}{3}$ K
x K ↑ " " " " " 602 K ↑

x : 100 = 602 : $100\frac{1}{3}$ x = 600 K

c.) 100 K naraste uz 5% za $2\frac{1}{2}$ g na 112·5 K
x K ↑ " " " " " 53484·30 K ↑

x : 100 = 53484·3 : 112·5 x = 47541·60 K

d.) 100 K naraste uz 4% za $4\frac{1}{2}$ g na 118 K
x K ↑ " " " " " 1288·56 K ↑

x : 100 = 1288·56 : 118 x = 1092 K

e.) 100 K naraste uz 3·5% za $\frac{3}{4}$ g na 102·625 K
x K ↑ " " " " " 4433·40 K ↑

x : 100 = 4433·4 : 102·625 x = 4320 K

C. Proračunavanje procenta.

1.) Buduća je glavnica 2 puta tolika, biti će i kamate za isto vrijeme uz iste postotke dvostruke /: Kamate = 48K :/

2.) Po 4%. Vidi primjedbu u knjizi.

3.) Izvađjen u knjizi.

4.) " " "

5.) a.) Procenti = $\frac{93 \cdot 50 \cdot 100}{680 \cdot 2 \cdot 5} = 5\frac{1}{2}\%$

b.) " = $\frac{475 \cdot 65 \cdot 100}{4530 \cdot 3 \cdot 5} = 3\%$

c.) " = $\frac{25 \cdot 100}{1000 \cdot 5} = \frac{1}{2}\%$

d.) " = $\frac{22 \cdot 23 \cdot 100}{280 \cdot 80 \cdot 9 \cdot 5} = 1{\cdot}2\%$

e.) " = $\frac{90 \cdot 90 \cdot 100}{7272 \cdot \frac{100}{365}} = 4{\cdot}5\%$

6.) Procenti = $\frac{1394 \cdot 100}{24600} = 5\frac{2}{3}\%$

7.) B treba da plaća iza prve godine kamate od 6000 + $4\frac{1}{2}\%$ od 6000 = 6000 + 270 = = 6270K, jer nije platio kamate, nego još uzajmio 1200K.

Kamate dakle iznose $\frac{6270 \cdot 4\frac{1}{2}}{100} = 282{\cdot}15$ K

Cijela uzajmljena svota sa jednogodišnjim kamatama od 6000K uz $4\frac{1}{2}\%$ iznosi:

6270 + 1200 = 7470K

7470	282·15
100 ↑	x ↑

x : 282·15 = 100 : 7470 $\quad x = 3{\cdot}776\%$

8.) Procenti = $\frac{800 \cdot 100}{800 \cdot 41\frac{2}{3}} = \frac{100}{\frac{125}{3}} = 2\frac{2}{5}\%$

9.) Za 7 mjeseci 1324K
" 4 " x ↑

x : 1324 = 4 : 7 $\quad x = 756\frac{4}{7}$ K

Najprije izračunaj koliko donese glavnica uz nepoznate postotke za 4 mjeseca

Neka glavnica donese za 4 mj. uz $3\frac{1}{3}\%$ 560K
" " " " 4 " " x% ↑ $756\frac{4}{7}$K ↑

$x : 3\frac{1}{3} = 756\frac{4}{7} : 560$

$x = 4{\cdot}5\%$

10.) Glavnica treba da donese za 9 mjeseci $2\frac{1}{2}$ puta više. Za 6 mjeseci donijet će $1\frac{2}{3}$ puta više /: 9 ↑ $2\frac{1}{2}$ puta / 6 ↑ x puta ↑ :/

$x = 1\frac{2}{3}$ puta

Ako neka glavnica uz isto vrijeme donese jednom $1\frac{2}{3}$ puta više kamata, to moraju i procenti biti $1\frac{2}{3}$ puta veći. T.j. glavnicu valja uložiti po $3 \cdot 1\frac{2}{3} = 5\%$

11.) Vjerovnik dobije dakle na ruku samo 800 - 10% od 800 = 800 - 80 = 720K. Budući bi pak vjerovnik kamate 80K morao platiti istom na kraju godine, gubi on kamate, što ih tih 80K za godinu dana donese, te plati u istinu 80 + 10% od 80 = 88K kamata, i to ne za 800K nego za 720K.

Procenti su po tome $\frac{88 \cdot 100}{720} = 12\frac{2}{9}\%$

12.) Dobitak = 4590 - 4250 = 340K

Procenti = $\frac{340 \cdot 100}{4250} = 8\%$

13.) 2520 K glanese uz 6% neke kamate
2880 K " " x % iste "
x : 6 = 2520 : 2880 x = $5\frac{1}{4}$ %

D. Proračunavanje vremena.

1.) 1 god. 14 K
x " 64 K x = $4\frac{4}{7}$ godine
x : 1 = 64 : 14

2.) Izostavljen u knjizi.

3.) a.) Vrijeme = $\frac{76 \cdot 26 \cdot 100}{635 \cdot 50 \cdot 4}$ = 3 god.

b.) " = $\frac{14 \cdot 70 \cdot 100}{560 \cdot 3 \cdot 5}$ = $\frac{3}{4}$ " = 9 mjeseci

c.) " = $\frac{20 \cdot 100}{1440 \cdot 3 \cdot 25}$ = $\frac{50}{117}$ god.

d.) " = $\frac{56 \cdot 25 \cdot 100}{30000 \cdot 4 \cdot 5}$ = $\frac{1}{24}$ g = $\frac{1}{2}$ mjeseca

4.) a.) Vrijeme = $\frac{3 \cdot 78 \cdot 100}{54 \cdot 10} \cdot 360$ = 126 dana

b.) " = $\frac{1 \cdot 44 \cdot 100}{360 \cdot 4} \cdot 360$ = 38 "

c.) " = $\frac{8 \cdot 25 \cdot 100}{297 \cdot 5} \cdot 360$ = 200 "

d.) " = $\frac{7 \cdot 100}{400 \cdot 4 \cdot 5} \cdot 360$ = 140 "

5.) $\frac{800 \cdot 100}{800 \cdot 5}$ = 20 godina

6.) a.) $\frac{100}{10}$ = 10 g; b.) $\frac{100}{4}$ = 25 g; c.) $\frac{100}{3 \cdot 5}$ = $28\frac{4}{7}$ g

d.) $\frac{100}{2}$ = 50 g

7.) Kamate iznose 9137·50 - 9000 = 137·50 K
Vrijeme = $\frac{137 \cdot 50 \cdot 100}{9000 \cdot 5 \cdot 5} \cdot 360$ = 100 dana
Dug je vraćen iza 100 = 3 mj. i 10 dana

8.) a.) Kamate iznose 7633·71 - 7560 = 73·71
Vrijeme = $\frac{73 \cdot 71 \cdot 100}{7560 \cdot 4 \cdot 5}$ = 78 dana. Dug je vraćen 1. sept.

8.) b.) Kamate iznose 3828·50 - 3800 = 28·50 K
Vrijeme = $\frac{28 \cdot 50 \cdot 100}{3800 \cdot 5} \cdot 360$ = 54 dana
Dug je vraćen 18. marta.

c.) Kamate iznose 1508 - 1500 = 8 K
Vrijeme = $\frac{8 \cdot 100}{1500 \cdot 4} \cdot 360$ = 48 dana
Dug je vraćen 1. Februara

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§. 39. Diskontni račun.

Zadaci su rađeni po ispravnom a ne po trgovačkom načinu diskontiranja.

1.) Na 112·5 K 12·5 K popusta (za $2\frac{1}{2}$ g)
" 1557 K x "
x : 12·5 = 1557 : 112·5 x = 173
Diskontirana glavnica = 1557 - 173 = 1384 K

2.) 106 K 6 K popusta (za 1 g)
22896 K x "
x : 6 = 22896 : 106 x = 1296

3.) Na 122·5 K 22·5 K popusta
" 33075 K x "
x : 22·5 = 33075 : 122·5 x = 6075
Diskontirana glavnica = 27000 K

4.) Prvi put treba diskontirati za $1\frac{1}{2} - \frac{1}{3} = \frac{7}{6}$ godine i to polovicu dužne svote.

$105\frac{5}{6}$ K $5\frac{5}{6}$ K popusta (za $\frac{7}{6}$ g uz 5%)
38843 K x "
x : $5\frac{5}{6}$ = 38843 : $105\frac{5}{6}$ x = 2140·95 K

Prvi put dakle plati $38843 - 2140{\cdot}95 = 36702{\cdot}05$ K

Drugi put valja diskontirati za $1\frac{1}{2} - \frac{2}{3} = \frac{5}{6}$ god.

105 K 5 K popusta /: za $\frac{5}{6}$ g uz 6% :/

38843 K ↑ x ↑ "

$x : 5 = 38843 : 105$ $x = 1849\frac{2}{3}$ K

Drugi put dakle plati $38843 - 1849\frac{2}{3} = 36993\frac{1}{3}$ K

5.) Najbolja je ponuda, koja daje najveću diskontiranu glavnicu.

A. 116·25 K 16·25 K popusta /: za $3\frac{1}{4}$ g uz 5% :/

7350 K ↑ x ↑ "

$x : 16{\cdot}25 = 7350 : 116{\cdot}25$. $x = 1027{\cdot}42$ K

Diskontirana glavnica $= 7350 - 1027{\cdot}42 = 6322{\cdot}58$ K

B. 110 K 10 K popusta /: za 2 g. uz 5% :/

7150 K ↑ x ↑ "

$x : 10 = 7150 : 110$ $x = 650$ K

Diskontirana glavnica $7150 - 650 = 6500$ K

C. Plaća 6525 K odmah.

C-ova je dakle ponuda najbolja.

6.) Dug je jednak diskontiranoj glavnici plus kamate kroz 5 god. uz $4\frac{1}{2}$ %

100 122·5 K /: za 5 g uz $4\frac{1}{2}$ % :/

3000 ↑ x ↑

$x : 122{\cdot}5 = 3000 : 100$ $x = 3675$ K

7.) Izračunjen u knjizi.

8.) Po uputi za zad. 7. u knjizi.

525 za $2\frac{1}{2}$ god 600 ↑ $x = 114\frac{2}{7}$

100 ↑ " " " x /: Nastavak na drugoj str. :/

$x : 600 = 100 : 525$

Kamate od 100 K za $2\frac{1}{2}$ god iznose dakle $14\frac{2}{7}$ K. Za 1 god /: procenti :/ su $= 14\frac{2}{7} : 2\frac{1}{2} = \frac{100}{7} : \frac{5}{2} = 5\frac{5}{7}$ %.

9.) Platiti valja $1500 - 300 = 1200$ K

Treba izračunati vrijeme, za koje 1200 K uz 5% donese 300 K

Vrijeme $= \frac{300 \cdot 100}{1200 \cdot 5} = 5$ godina.

10.) a.) 101 K 1 K popusta /: uz 4% za $\frac{1}{4}$ g :/

1080 K ↑ x ↑

$x : 1 = 1080 : 101$ $x = 10{\cdot}69$ K

Diskontirana glavnica $= 1080 - 10{\cdot}69 = 1069{\cdot}31$ K

b.) $100\frac{5}{3}$ K $\frac{5}{3}$ K popusta /: za $\frac{1}{3}$ g uz 5% :/

4500 K ↑ x ↑

$x : \frac{5}{3} = 4500 : 100\frac{5}{3}$ $x = 73{\cdot}77$ K

Diskontirana glavnica $= 4500 - 73{\cdot}77 = 4426{\cdot}23$ K

c.) $100\frac{5}{12}$ K $\frac{5}{12}$ K popusta /: uz $3\frac{1}{3}$ % za $1\frac{1}{2}$ mj. $= \frac{1}{8}$ g :/

1305 K ↑ x ↑ "

$x : \frac{5}{12} = 1305 : 100\frac{5}{12}$ $x = 5{\cdot}41$

Diskontirana glavnica $= 1305 - 5{\cdot}41 = 1299{\cdot}59$ K

d.) $101\frac{1}{8}$ K $1\frac{1}{8}$ K popusta /: uz 6% za $2\frac{1}{4}$ mj. $= \frac{3}{16}$ g :/

10125 K ↑ x ↑ "

$x : 1\frac{1}{8} = 10125 : 101\frac{1}{8}$ $x = 112{\cdot}63$ K

Diskontirana glavnica $= 10125 - 112{\cdot}63 = 10012{\cdot}37$ K

11.) Ima se diskontirati za 123 dana uz $4\frac{1}{2}$ %

$101\frac{43}{80}$ K $1\frac{43}{80}$ K popusta

972 K ↑ x ↑ "

$x : 1\frac{43}{80} = 972 : 101\frac{43}{80}$

$x = 14{\cdot}72$

Diskontirana glavnica $= 972 - 14{\cdot}72 = 957{\cdot}28$ K

12.) Ima se diskontirati za 44 dana uz 8%

$100\frac{44}{45}$ K $\frac{44}{45}$ K popusta

1350 K ↑ x ↑

$x : \frac{44}{45} = 1350 : 100\frac{44}{45}$ $x = 13{\cdot}07$

Diskontirana glavnica = 1350 - 13·07 = 1336·93 K

13.) Ima se diskontirati za 128 dana uz 8·5%

103 K 3 K popusta

935 K ↑ x ↑ "

$x : 3 = 935 : 103$ $x = 27{\cdot}233$ K

Diskontirana glavnica = 935 - 27·233 = 907·77 K

14.) Ima se diskontirati za 93 dana uz 6·5%

101·68 K 1·68 K popusta

2875 K ↑ x ↑

$x : 1{\cdot}68 = 2875 : 101{\cdot}68$ $x = 47{\cdot}50$ K

Diskontirana glavnica = 2875 - 47·50 = 2827·50 K

15.) $101\frac{43}{144}$ K $1\frac{43}{144}$ K popusta /: za 85 dana uz $5\frac{1}{2}$% :/

2540 ↑ x ↑

$x : \frac{187}{144} = 2540 : \frac{14587}{144}$ $x = 32{\cdot}56$ rublja

Diskontirana glavnica = 2540 - 32·56 = 2507·44 Rb.

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§. 40. Diobeno pravilo.

A. Dijeljenje po aritmetičkom omjeru.

1.) Da dobije svaki jednako, morali bi biti 20 K manje t.j. 300 K. Onda bi svaki dobio 150 K. A dobije dakle 170 K a B 150 K.

2.) Djevojčica ima $\frac{96-4}{2} = 46$; dječaka ima 46 + 4 = 50

3.) B dobije 1 dio

A " 1 " - 180 K

C " 1 " + 120 K

Ukupno dobiju 3 dijela - 60 K što mora biti 1200 K dio = $\frac{1200+60}{3} = 420$ K

A dobije 420 - 180 = 240 K

B " 420 K

C " 420 + 120 = 540 K

4.) Budući da B dobije 20 kg više od A, a C 30 kg manje od B a dobije C 10 kg manje od A

A dobije 1 dio

B " 1 "

C " 1 "

Ukupno dobiju 3 dijela 10 kg što mora biti 100 kg. 1 dio = $\frac{100-10}{3} = 30$ kg

A dobije 30 kg

B " 30 + 20 = 50 kg

C " 30 - 10 = 20 kg

5.) Budući da ima 3 jabuke više od krušaka a 9 šljiva više od jabuka, znači šljiva više od krušaka

Krušaka ima 1 dio

Jabuka " 1 " + 3

Šljiva " 1 " + 12

Ukupno ima 3 dijela + 15 što mora biti 81 voćka. 1 dio = $\frac{81-15}{3} = 22$

Krušaka ima 22, jabuka 22 + 3 = 25, šljiva 22 + 12 = 34.

6.) Prvo dijete dobije 1 dio = 58 h
drugo " " 1 " + 1 h = 59 h
treće " " 1 " + 2 h = 60 h
četvrto " " 1 " + 3 h = 61 h
peto " " 1 " + 4 h = 62 h

Ukupno ima dakle 5 dijelova + 10 h, što mora biti 300 h. 1 dio = $\frac{300-10}{5}$ = 58 h

7.) B ima dakle $\frac{39}{3}$ = 13 g
A " " 13 + $2\frac{1}{2}$ = $15\frac{1}{2}$ g
C " " 13 − $2\frac{1}{2}$ = $10\frac{1}{2}$ g

U izradbi u knjizi uzeto je pogrješno 30 mjesto 39 godina.

8.) Prvi je broj 1 dio
Drugi " " 1 " + 53
Treći " " 1 " + 77

Ukupno ima dakle 3 dijela + 130, što mora biti 1000. 1 dio = $\frac{1000-130}{3}$ = 290
Prvi je broj 290, drugi 343, a treći 367

B Dijeljenje po geometričkom omjeru.

I. Prosto diobeno pravilo.

1.) 4 i 3 su omjerni brojevi
A dobije $\frac{84}{4+3} \cdot 4 = 48$ K
B " $\frac{84}{4+3} \cdot 3 = 36$ K

2.) Jedan dio = $\frac{1248}{4+9} \cdot 4 = 96 \cdot 4 = 384$
Drugi " = $\frac{1248}{4+9} \cdot 9 = 96 \cdot 9 = 864$

3.) Omjerni su brojevi 2 : 1
Majstor dobije $\frac{186}{2+1} \cdot 2 = 62 \cdot 2 = 124$ K
Pomoćnik " $\frac{186}{2+1} \cdot 1 = 62$ K

4.) Omjerni su brojevi 3 : 1 : 1 : 1
Majstor dobije $\frac{43 \cdot 75}{3+1+1+1} \cdot 3 = 7 \cdot 29 \cdot 3 = 21 \cdot 87$ K
Svaki pomoćnik dobije $\frac{43 \cdot 75}{3+1+1+1} \cdot 1 = 7 \cdot 29$

5.) Omjerni su brojevi 4 : 6 : 6 : 1
terpentina ima $\frac{21 \cdot 25}{4+6+6+1} \cdot 4 = 1 \cdot 25 \cdot 4 = 5$ kg
cinobra ima $\frac{21 \cdot 25}{4+6+6+1} \cdot 6 = 1 \cdot 25 \cdot 6 = 7 \cdot 5$ kg
šelaka ima $\frac{21 \cdot 25}{4+6+6+1} \cdot 6 = 1 \cdot 25 \cdot 6 = 7 \cdot 5$ kg
kreda ima $\frac{2 \cdot 25}{4+6+6+1} \cdot 1 = 1 \cdot 25$ kg

6.) Omjerni su brojevi 27 : 21 : 15 ili 9 : 7 : 5
A dobije $\frac{207}{9+7+5} \cdot 9 = 10 \cdot 9 = 90$ K
B " $\frac{207}{9+7+5} \cdot 7 = 10 \cdot 7 = 70$ K
C " $\frac{207}{9+7+5} \cdot 5 = 10 \cdot 5 = 50$ K

7.) Lijena srećke ne mora biti poznata
Omjerni su brojevi $\frac{1}{2} : \frac{1}{3} : (1 - \frac{1}{2} - \frac{1}{3} = \frac{1}{6})$ ili 3 : 2 : 1
A dobije $\frac{600}{3+2+1} \cdot 3 = 100 \cdot 3 = 300$ K
B " $\frac{600}{3+2+1} \cdot 2 = 100 \cdot 2 = 200$ K
C " $\frac{600}{3+2+1} \cdot 1 = 100$ K

8.) Omjerni su brojevi 100 : 30 ili 10 : 3
A dobije $\frac{208}{10+3} \cdot 10 = 16 \cdot 10 = 160$
B " $\frac{208}{10+3} \cdot 3 = 16 \cdot 3 = 48$

9.) Omjerni su brojevi /: A, B, C :/ 100 : 112 : 90 ili 50 : 56 : 45. /: Nastavak na drugoj str. :/

A dobije: $\frac{1540 \cdot 20}{50+56+45} \cdot 50 = 10 \cdot 20 \cdot 50 = 510\,K$

B " $\frac{1540 \cdot 20}{50+56+45} \cdot 56 = 10 \cdot 20 \cdot 56 = 571{\cdot}20\,K$

C " $\frac{1540 \cdot 20}{50+56+45} \cdot 45 = 10 \cdot 20 \cdot 45 = 459{\cdot}0\,K$

10.) Omjerni su brojevi 12800 : 4300 : 3800
ili 128 : 43 : 38

A dobije $\frac{2944}{128+43+38} \cdot 128 = 14{\cdot}09 \cdot 128 = 1803{\cdot}52$

B " $\frac{2944}{128+43+38} \cdot 43 = 14{\cdot}09 \cdot 43 = 605{\cdot}87$

C " $\frac{2944}{128+43+38} \cdot 38 = 14{\cdot}09 \cdot 38 = 535{\cdot}42$

Na 12800 K dobije A 1803·52 K
" 100 K ↑ " x ↑

$x : 1803{\cdot}52 = 100 : 12800 \quad x = 14{\cdot}09\,\%$

11.) Omjerni su brojevi 2460·65 : 3708·70 :
: 2917 ili 492·13 : 741·74 : 583·4

15·4 % uloga = $\frac{15{\cdot}4 \cdot 9086{\cdot}35}{100} = 1399{\cdot}30\,K$

Ukupni dobitak iznosi dakle
1399·30 + 208·53 = 1607·83 K

A dobije $\frac{1607{\cdot}83}{492{\cdot}13+741{\cdot}74+583{\cdot}4} \cdot 492{\cdot}13 = 435{\cdot}41$

B " $\frac{1607{\cdot}83}{492{\cdot}13+741{\cdot}74+583{\cdot}4} \cdot 741{\cdot}74 = 656{\cdot}26$

C " $\frac{1607{\cdot}83}{492{\cdot}13+741{\cdot}74+583{\cdot}4} \cdot 583{\cdot}4 = 516{\cdot}16$

12.) Omjerni su brojevi 2000 : 3400 : 1800 ili
10 : 17 : 9

A plati $\frac{1440}{10+17+9} \cdot 10 = 40 \cdot 10 = 400\,K$

B " $\frac{1440}{10+17+9} \cdot 14 = 40 \cdot 14 = 680\,K$

C " $\frac{1440}{10+17+9} \cdot 9 = 40 \cdot 9 = 360\,K$

13.) Omjerni su brojevi 2 : 3

I. dio = $\frac{60}{2+3} \cdot 2 = 12 \cdot 2 = 24$

II. " $\frac{60}{2+3} \cdot 3 = 12 \cdot 3 = 36$

14.) Omjerni su brojevi $\frac{5}{2} : \frac{2}{3}$ ili 15 : 4

I. dio = $\frac{228}{15+4} \cdot 15 = 12 \cdot 15 = 180$

II. " = $\frac{228}{15+4} \cdot 4 = 12 \cdot 4 = 48$

15.) Plaće se odnose kao $\frac{1}{2} : \frac{5}{4} : 3$
Prinosi su u obrnutom omjeru t.j.:
2 : $\frac{4}{5}$: $\frac{1}{3}$ ili 30 : 12 : 5

Mjesto A plati $\frac{3760}{30+12+5} \cdot 30 = 80 \cdot 30 = 2400\,K$

" B " $\frac{3760}{30+12+5} \cdot 12 = 80 \cdot 12 = 960\,K$

" C " $\frac{3760}{30+12+5} \cdot 5 = 80 \cdot 5 = 400\,K$

16.) Treba najprije odbiti od 2710 K 6 %
od 2710 K što dobije A. 2710 − 6·27·10 =
= 2547·40 K /: 6 % od 2710 = 162·60 K :/
Omjerni su brojevi $\frac{1}{4} : \frac{1}{3} : \frac{5}{12}$ ili 3 : 4 : 5

A dobije $\frac{2547{\cdot}40}{3+4+5} \cdot 3 + 162{\cdot}60 = 799{\cdot}45\,K$

B " $\frac{2547{\cdot}40}{3+4+5} \cdot 4 = 849{\cdot}13\,K$

C " $\frac{2547{\cdot}40}{3+4+5} \cdot 5 = 1061{\cdot}416\,K$

17.) A dobije 1 dio, B 2 dijela, a C 3 puta
toliko kao B t.j. 6 dijelova.
Omjerni su brojevi dakle 1 : 2 : 6

A dobije $\frac{3060}{1+2+6} \cdot 1 = 340\,K$

B " $\frac{3060}{1+2+6} \cdot 2 = 340 \cdot 2 = 680\,K$

C " $\frac{3060}{1+2+6} \cdot 6 = 340 \cdot 6 = 2040\,K$

18.) A dobije 1 dio; B dobije onoliko puta po 3K koliko se puta nalaze 2K u dijelu od A t.j. $\frac{3}{2}$ dijela od A. C dobije onoliko puta po 5K koliko se puta 4K nalaze u dijelu od B t.j. ($\frac{3}{2}$ dijela : 4) · 5 = $\frac{3}{8} \cdot 5 = \frac{15}{8}$ dijela od A.

Omjerni su brojevi 1 : $\frac{3}{2}$: $\frac{15}{8}$ ili 8 : 12 : 15

A dobije $\frac{5600}{8+12+15} \cdot 8 = 1280$ K

B " $\frac{5600}{8+12+15} \cdot 12 = 1920$ K

C " $\frac{5600}{8+12+15} \cdot 15 = 2400$ K

19.) A dobije 1 dio; B dobije onoliko puta po 4K koliko se puta nalaze 3K u dijelu od A t.j. $\frac{4}{3}$ dijela od A. C pak onoliko puta po 4K koliko se puta nalaze 3K u dijelu od B t.j. $\frac{4}{3}$ B-ovog dijela = $\frac{4}{3} \cdot \frac{4}{3}$ A-ovog dijela = $\frac{16}{9}$ A ovog dijela. D napokon dobije onoliko puta po 5K koliko se puta nalaze 3K u B-ovom dijelu t.j. $\frac{5}{3}$ B-ovog dijela = $\frac{5}{3} \cdot \frac{4}{3}$ A ovog dijela = $\frac{20}{9}$ A-ovog dijela.

Omjerni su brojevi 1 : $\frac{4}{3}$: $\frac{16}{3}$: $\frac{20}{9}$ ili 9 : 12 : 16 : 20

A dobije $\frac{2280}{9+12+16+20} \cdot 9 = 40 \cdot 9 = 360$ K

B " $\frac{2280}{9+12+16+20} \cdot 12 = 40 \cdot 12 = 480$ K

C " $\frac{2280}{9+12+16+20} \cdot 16 = 40 \cdot 16 = 640$ K

D " $\frac{2280}{9+12+16+20} \cdot 20 = 40 \cdot 20 = 800$ K

20.) Uložio je svaki prema proporcionalnom svom dobitku. Omjerni su brojevi 60 : 100 : 160 : 80 ili 3 : 5 : 8 : 4

A je uložio $\frac{3190}{3+5+8+4} \cdot 3 = 159 \cdot 5 \cdot 3 = 478 \cdot 5$ K

B " " $\frac{3190}{3+5+8+4} \cdot 5 = 159 \cdot 5 \cdot 5 = 797 \cdot 5$ K

C " " $\frac{3190}{3+5+8+4} \cdot 8 = 159 \cdot 5 \cdot 8 = 1276 \cdot 0$ K

D " " $\frac{3190}{3+5+8+4} \cdot 4 = 159 \cdot 5 \cdot 4 = 638 \cdot 0$ K

21.) a.) Sumpora ima $\frac{145}{17+3+5} \cdot 3 = 5 \cdot 8 \cdot 3 = 17 \cdot 4$ kg

b.) Ugljena " $\frac{172 \cdot 5}{17+3+5} \cdot 5 = 6 \cdot 9 \cdot 5 = 34 \cdot 5$ kg

22.) a.) 1 M = 1·17 K ; 1 fr = 0·95 K

Omjerni su brojevi 1 : 0·95 : 1·17 ili 100 : 95 : 117

A dobije $\frac{3744}{100+117+95} \cdot 95 = 12 \cdot 95 = 1140$ K

B " $\frac{3744}{100+117+95} \cdot 117 = 12 \cdot 117 = 1404$ K

C " $\frac{3744}{100+117+95} \cdot 100 = 12 \cdot 100 = 1200$ K

b.) 1 K = $\frac{100}{117}$ marake ; 1 fr = 0·95 K = $\frac{95}{117}$ marka

Omjerni su brojevi $\frac{95}{117}$: 1 : $\frac{100}{117}$ ili 95 : 117 : 100

A dobije $\frac{7176}{95+117+100} \cdot 95 = 23 \cdot 95 = 2185$ mar.

B " $\frac{7176}{95+117+100} \cdot 117 = 23 \cdot 117 = 2691$ "

C " $\frac{7176}{95+117+100} \cdot 100 = 23 \cdot 100 = 2300$ "

c.) 1 K = $\frac{100}{95}$ franka ; 1 marka = 1·17 K = $\frac{117}{95}$ franka

Omjerni su brojevi 1 : $\frac{117}{95}$: $\frac{100}{95}$ ili 95 : 117 : 100

A dobije $\frac{5616}{95+117+100} \cdot 95 = 18 \cdot 95 = 1710$ franaka

B " $\frac{5616}{95+117+100} \cdot 117 = 18 \cdot 117 = 2106$ "

C " $\frac{5616}{95+117+100} \cdot 100 = 18 \cdot 100 = 1800$ "

23.) Omjerni su brojevi $\frac{1}{2} : \frac{1}{3} : \frac{1}{4}$ ili $\frac{6}{12} : \frac{4}{12} : \frac{3}{12}$

v.j.: 6:4:3

Prvi dobije $\frac{3120}{6+4+3} \cdot 6 = 240 \cdot 6 = 1440$ K

Drugi " $\frac{3120}{6+4+3} \cdot 4 = 240 \cdot 4 = 960$ K

Treći " $\frac{3120}{6+4+3} \cdot 3 = 240 \cdot 3 = 720$ K

24.) C je uložio ostatak potrebnog novca v.j.

$1 - \frac{2}{5} - \frac{1}{4} = \frac{7}{20}$. $\frac{7}{20}$ potrebnog novca = 637 K

$\frac{20}{20} = 1$ = cio potrebni novac = $637 \cdot \frac{20}{7} = 1820$ K

v.j.: Primjer: $\frac{1}{2}$ potr. novca = 20 K, cio potr. nov. = $20 \cdot \frac{2}{1} = 40$ K v.j.

A je uložio $1820 \cdot \frac{2}{5} = 728$ K; B je uložio $1820 \cdot \frac{1}{4} = 455$ K.

Omjerni su brojevi $\frac{2}{5} : \frac{1}{4} : \frac{7}{20}$ ili 8:5:7.

Mogu se uzeti kao omjerni brojevi i sume što ih je pojedini uložio: 728:455:637 ili 8:5:7.

A dobije $\frac{1020}{8+5+7} \cdot 8 = 51 \cdot 8 = 408$ K

B " $\frac{1020}{8+5+7} \cdot 5 = 51 \cdot 5 = 255$ K

C " $\frac{1020}{8+5+7} \cdot 7 = 51 \cdot 7 = 357$ K

25.) Ostatak što ga je dao D iznosi:

$1 - \frac{1}{3} - \frac{1}{4} - \frac{1}{5} = 1 - \frac{20}{60} - \frac{15}{60} - \frac{12}{60} = \frac{13}{60}$

$\frac{13}{60}$ skupljene svote = 520 K

$\frac{60}{60} = 1$ " " $= 520 \cdot \frac{60}{13} = 2400$ K

II. Sastavljeno diobeno pravilo

1.) A pošalje 12 žitarica 10 dana = 120 | 10

B " 6 " " 4 " = 24 | 2

C " 12 " " 15 " = 180 | 15

405 : 27 = 15

1: Nastavak na drugoj str.:)

A dobije 15 . 10 = 150 K

B " 15 . 2 = 30 K

C " 15 . 15 = 225 K

2.) A ima 12 krava 20 dana = 240 | 2 A plati 5·5·2 = 11 K

B " 15 " 24 " = 360 | 3 B " 5·5·3 = 16·5 K

C " 20 " 18 " = 360 | 3 C " 5·5·3 = 16·5 K

44 : 8 = 5·5

3.) A pošalje 50+150 ljudi na 3 dana = 600 | 2

B " 36+60 " " $12\frac{1}{2}$ " = 1200 | 4

C " 24+108 " " 25 " = 3300 | 11

7140 : 17 = 420

A dobije 420 . 2 = 840 K

B " 420 . 4 = 1680 K

C " 420 . 11 = 4620 K

4.) A je radio 8 dana po 5 sati = 40 | 40

B " " 9 " " 7 " = 63 | 63

C " " 12 " " 4 " = 48 | 48

D " " 10 " " 6 " = 60 | 60

E " " 15 " " 4 " = 60 | 60

F " " 6 " " 8 " = 48 | 48

143·55 : 319 = 0·45

A dobije 0·45 . 40 = 18 K

B " 0·45 . 63 = 28·35 K

C " 0·45 . 48 = 21·60 K

D " 0·45 . 60 = 27·00 K

E " 0·45 . 60 = 27·00 K

F " 0·45 . 48 = 21·60 K

5.) A je uložio 1500 na 1 g = 1500 | 45
B " " 1200 " $\frac{1}{2}$ g = 600 | 18
C " " 100 " $\frac{2}{5}$ g = $\frac{2000}{3}$ | 20
996 : 83 = 12

A dobije 12.45 = 540 K
B " 12.18 = 216 K
C " 12.20 = 240 K

6.) A je držao 20 ljudi 28 dana = 560 | 28
B " " 25 " 20 " = 500 | 25
C " " 24 " 30 " = 720 | 36
D " " 30 " 16 " = 480 | 24
1627.20 : 113 = 14.40

A dobije 14.40.28 = 403.20 K
B " 14.40.25 = 360.00 K
C " 14.40.36 = 518.40 K
D " 14.40.24 = 345.60 K

7.) M je pozajmio od A 726 K po 4% = 29.04 | 363
" " " B 1280 K " $3\frac{4}{5}$% = 48.64 | 608
" " " C 864 K " $5\frac{3}{4}$% = 49.68 | 621
1178.08 : 1592 = 0.74

A dobije 0.74.363 = 268.62 K
B " 0.74.608 = 449.92 K
C " 0.74.621 = 459.54 K

8.) A trguje sa 8000 K 1 god = 8000 | 96
B " " 4000 K $\frac{3}{4}$ " = 3000 | 36
C " " 5000 K $\frac{7}{12}$ " = $\frac{8750}{3}$ | 35
1336 : 167 = 8

A dobije 8.96 = 768 K, B dobije 8.36 = 288 K
C " 8.35 = 280 K

9.) A za 4 sata 15 hl = 60 | 30 A dobije 18.30 = 540 hl
B " 3 " 16 " = 48 | 24 B " 18.24 = 432 hl
C " 5 " 14 " = 70 | 35 C " 18.35 = 630 hl
D " 2 " 9 " = 18 | 9 D " 18.9 = 162 hl
1764 : 98 = 18

10.) Općina A ima 260 kuća 2 Km udaljeno
" B " 360 " 4 " "
" C " 400 " 4 " "
" D " 560 " 8 " "

Omjerni su brojevi za broj kuća 13 : 18 : 20 : 28
Za udaljenost bi bili 1 : 2 : 2 : 4
Budući da omjer za udaljenosti treba da budne obrnut, biće 4 : 2 : 2 : 1. Tako dobijemo konačne omjerne brojeve:
13.4 : 18.2 : 20.2 : 28.1 ili 13 : 9 : 10 : 7
Općina A plati $\frac{39624}{13+9+10+7} \cdot 13 = 1016.13 = 13208$ K
" B " $\frac{39624}{13+9+10+7} \cdot 9 = 1016.9 = 9144$ K
" C " $\frac{39624}{13+9+10+7} \cdot 10 = 1016.10 = 10160$ K
" D " $\frac{39624}{13+9+10+7} \cdot 7 = 1016.7 = 7112$ K

11.) A je izgubio $\frac{1260}{1400} = \frac{9}{10}$ svoga imetka
B " " $\frac{1700}{8500} = \frac{1}{5}$ " "
C " " $\frac{7200}{7200} = 1$ " "

Omjerni su brojevi $\frac{9}{10} : \frac{1}{5} : 1$ ili 9 : 2 : 10
A dobije $\frac{5040}{9+2+10} \cdot 9 = 240.9 = 2160$ K
B " $\frac{5040}{9+2+10} \cdot 2 = 240.2 = 480$ K
C " $\frac{5040}{9+2+10} \cdot 10 = 240.10 = 2400$ K

12.) Omjerne brojeve za udaljenost treba uzeti obrnuto:

A $\frac{2400.360.150}{6} = 45$ | A plati 325.45 = 14625 K
B $\frac{1800.320.180}{4} = 54$ | B " 325.54 = 17550 K
C $\frac{1600.240.120}{3} = 32$ | C " 325.32 = 10400 K

42575 : 131 = 325

Primjedba: brojevi 45, 54 i 32 nisu općenito razlomci, nego već skraćeni omjerni brojevi.

13.) A 8 radnika na 8 dana = 64 | 32
B 12 " " 5 " = 60 | 30
C 15 " " 6 " = 90 | 45

963 : 107 = 9

A dobije 9.32 = 288 K
B " 9.30 = 270 K
C " 9.45 = 405 K

14.) Gospoda 12 po 1K = 12 | 60
Gospođa 14 po 0·5 = 7 | 35
djece 18 po 0·2 K = 3·6 | 18

56·50 : 113 = 0·5

Svaki je gospodin dao $\frac{0{\cdot}5.60}{12} = 2{\cdot}5$ K
Svaka je gospođa dala $\frac{0{\cdot}5.35}{14} = 1{\cdot}25$ K
Svako je dijete dalo $\frac{0{\cdot}5.18}{18} = 0{\cdot}50$ K

§ 41. Poprečni račun.

Izostavljeno radi jednostavne izradbe.

§ 42. Račun smjese.

1.) 1. vrsta 50 h | 20 | 2 Na svake 2 kg lošije
60 vrste mora uzeti
2. " 80 h | 10 | 1 1 kg bolje vrste

180 : 3 = 60

Lošije vrste 60.2 = 120 kg; bolje vrste 60 kg

2.) 1. vrsta 36 h | 20 | 5 Na 5 kg lošije
40 vrste 1 kg bolje vrste.
2. " 60 h | 4 | 1

168 : 6 = 28

Lošije vrste 28.5 = 140 kg; bolje vrste 28 kg

3.) 1 vrsta 46 | 22 | 11 Omjerni su brojevi:
62 11 : 8
2 " 84 | 16 | 8

228 : 19 = 12

Krčmar će pomiješati 12.11 = 132 l lošijeg i 12.8 = 96 l boljeg vina.

4.) 1 vrsta 3·80 | 0·15 | 3 Omjerni su brojevi
3·55 3 : 5
2 " 3·40 | 0·25 | 5 9·6 : 8 = 1·2

Trgovac će uzeti 1·2.3 = 3·6 kg bolje vrste i 1·2.5 = 6 kg lošije vrste.

5.) 1 vrsta 0·700 | 0·150 | 3 Omjerni su brojevi
0·750 3 : 1
2 " 0·900 | 0·050 | 1

23·4 : 4 = 5·85

Treba uzeti prebra od čistine 9·700 5·85.3 = 17·55 kg i prebra od 0·900 čistine 5·85 kg

6.) 1. vrsta (voda) 0 | 16 | 1
64
2. " 80 | 64 | 4
Na 4l vina 1l vode
" 30l ↑ " x ↑ "
x : 1 = 30 : 4 x = 7·5l vode.

7.) 1. vrsta 90 | 5 | 1 Omjer mi su brojevi
70
2. " 65 | 20 | 4 1 : 4
720 : 5 = 144
Treba uzeti 144.1 = 144l prve vrste i
144.4 = 576l druge vrste.

8.) 1. vrsta 60 | 6 | 3
40
2 " 76 | 10 | 5
Na 3l lošije vrste 5l bolje vrste
" 135l " ↑ " x ↑ " "
x : 5 = 135 : 3 x = 225l bolje vrste

9.) 1. voda 15° | 6 | 2
24°
2 " 30° | 9 | 3
Na 2hl vode od 15° treba dolitи 3hl vode od 30°
" 4hl " " " " " x " " "
x = 6hl vode od 30°

10.) bakar 0 | 0·300 | 6 Bakar =
0·550
srebro 0·850 | 0·550 | 11 = 3.6 = 18dkg
57 : 17 = 3

11.) i 12.) Izradi po 3. zadatku u tumačenju u knjizi.

13.) Bakar 0 | 4 | 2 Na 5kg 14-ostrugog srebra 2kg bakra
10
srebro 14 | 10 | 5 " ¼ kg " ↑ " " x ↑ "
x : 2 = ¼ : 5 x = 1/10 kg = 100g

14.) Izradi po 3. zadatku u tumačenju u knjizi.

15.) bakar 0 | 0·150 | 3
0·850
čisto srebro 1·000 | 0·850 | 17
Na 17kg čista srebra 3kg bakra
" 6·8 ↑ " " x ↑ "
x : 3 = 6·8 : 17 x = 1·2kg bakra

16.) bakar 0 | 0·250 | 5
0·700
žlato 0·950 | 0·700 | 14
Na 14 dijelova žlata od 0·950 čistine 5 dijel. bakra
" 4·2 ↑ " " " " " " x ↑ " "
x : 5 = 4·2 : 14 x = 1·5kg bakra

17.) Mora dodati: $6 - 4\frac{1}{2} = 1\frac{1}{2}$ kg srebra nepoznate čistine.
U 6kg srebra čistine 0·800 ima 6.0·800 = 4·8kg čista srebra. U 4·5 kg srebra čistine 0·850 ima 4·5. 0·850 = 3·825kg čista srebra.
U $1\frac{1}{2}$ kg srebra nepoznate čistine ima dakle 4·5 - 3·825 = 0·975kg čista srebra, t.j. njegova je čistina $\frac{0·975}{1·5} = 0·650$.

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§. 43. Skraćeno računanje.

Izostavljeno radi jednostavnih izvadaka.

§ 44. Skraćeno zbrajanje i
§. 45. Skraćeno oduzimanje.

1.) 6·05328 6·053
27·5821 + 27·582
53·4358 53·436
0·80738 0·807
87·87138 = 87·8

2.) $58{\cdot}878787 + 2{\cdot}76348 + 24{\cdot}248248 + 0{\cdot}777777$

$58{\cdot}87879 + 2{\cdot}76348 + 24{\cdot}24825 + 0{\cdot}77778 = 86{\cdot}668330 = 86{\cdot}6683$

3.) $2{\cdot}345\ldots + 0{\cdot}5920\ldots + 5{\cdot}37902 + 4{\cdot}3563\ldots$

$2{\cdot}345 + 0{\cdot}593 + 5{\cdot}379 + 4{\cdot}356 = 12{\cdot}673 = 12{\cdot}67$

4.) $5{\cdot}82 \cdot 74_0 + 837_{000} + 4300$

Budući su kod trećeg sumanda samo desetinućice poznate otpada 1. i 4. sumand, jer ne utiču na znamenku desetinućica.

$74_0 + 837_{000} + 1000 + 837_{000} = 838000 = 84_{0000}$

5.) a.) $756{\cdot}5847 - 374{\cdot}583625$

$756{\cdot}585 - 374{\cdot}584 = 382{\cdot}001 = 382{\cdot}00$

b.) $34{\cdot}742742\ldots - 17{\cdot}876767\ldots$

$34{\cdot}74274 - 17{\cdot}87677 = 16{\cdot}865971 = 16{\cdot}8660\ldots$

6.) a.) $25{\cdot}382\ldots \cdot 7{\cdot}235\ldots = 183{\cdot}147$

b.) $48{\cdot}33\ldots \cdot 12{\cdot}57\ldots = 607{\cdot}476$

c.) $324{\cdot}2456\ldots \cdot 193{\cdot}9354\ldots = 62863{\cdot}3102$

d.) $9{\cdot}45 \cdot 0{\cdot}28\ldots = 9{\cdot}17$

e.) $13{\cdot}73 \cdot 2{\cdot}38 = 11{\cdot}35$

f.) $5{\cdot}3636 \cdot 3{\cdot}2845 = 2{\cdot}07941$

7.) a.) $2\frac{5}{17} = 2{\cdot}29411\ldots$ $\quad \frac{8}{13} = 0{\cdot}61538\ldots$

$2{\cdot}2941 - 0{\cdot}6154 = 1{\cdot}67871$

b.) $1\frac{2}{3} = 3{\cdot}0538\ldots - 1{\cdot}66666\ldots$

$3{\cdot}0538 - 1{\cdot}6667 = 1{\cdot}38721$

c.) $3\frac{1}{7} = 3{\cdot}142857 - 1{\cdot}3281$

$3{\cdot}1429 - 1{\cdot}3281 = 1{\cdot}81448$

§ 46. Skraćeno množenje.

1.) $73{\cdot}4582 \times 358{\cdot}0926$ na 2 dec tačno = 3 dec

$358{\cdot}0926 \cdot 285437 = 25066482 + 1074278 + 143237 + 17905 + 2864 + 72 = 26304838$

2.) $0{\cdot}957063 \times 0{\cdot}56347$ na 3 dec tačno = 4 dec

$0{\cdot}95703 \cdot 74365 = 4785 + 574 + 29 + 4 = 0{\cdot}53921$

3.) $732{\cdot}46 \times 3{\cdot}530272$ na 1 dec tačno = 2 dec

$732{\cdot}46 \cdot 2720353 = 219738 + 36623 + 2197 + 15 + 5 = 2535{\cdot}78$

4.) $35726{\cdot}450 \times 0{\cdot}073542$ na 3 dec tačno = 4 dec.

$35726{\cdot}450 \cdot 24537 = 25008515 + 1071794 + 178632 + 14290 + 714 = 2627{\cdot}3945$

5.) 8354·62 x 26·436 na jedinice tačno = 1 dec.

8354·62
63462

1670924
501277
33418
2506
501

220862·6

6.) 783024·8366 x 34·752
na desetine tačno = 2 dec

783024·8366
25743

2349074510
313209934
5481738
3915124
156605

27211679·11

7.) 235·75 x 1·85493

235·75
3945·81

23575
18860
1179
94
21
1

437·30 Km

8.) 50995370 0
9277371

509953700
356967590
15298611
3569676
356967
10199
4589

88616133 2

9.) Ekvator ima 360·15 = 5400 geogr. milja

7419·728
0045

371
30

40100 Km

10.) 56·3472 x 7·3964 x 0·864 na 2 dec. tačno = 3 dec
na 1 dec. na 3 dec.

56·3472
1·9937

39443
1690
507
54
3

416·76

416·76
468

333408
25006
1067

360·081

11.) 27·0483 x 63·4057 x 0·72834 na 1 dec
na 1 dec. na 2 dec.
tačno = 2 dec

27·0483
75436

16229
811
108
1

1714·9

1714·9
4382·7

120043
3430
1371
51
7

1249·02

12.) 0·8379 x 78·536 x 0·038724 na 5 dec.
na 4 dec. na 6 dec.
tačno = 6 dec.

0·8379
463587

586530
67032
4190
257
50
3

65·8056

65·8056
42783

1974168
526445
46064
1316
263

2548256

na jedinice na 2 dec.

13.) 208·79 x 6435 x 0·00734 na 1 dec. tačno = 2 dec

208·79
5346

1252740
83510
6264
1044

1343564

1343564
7437437

9404 95
40307
5374
940
40
5
1

9871·62

4 dec. 4 dec. 3 dec.

14.) 8·345 x 0·7348 x 7·2345 x 28276 na 2 dec.
tačno = 3 dec.

8·3455
8437

58419
2504
334
66

6·1323

6·1323
54327

42926 1
12265
1840
245
31

44·3642

44·3642
67282

887284
354913
8873
3105
266

1254·441

Množenje nepotpunih decimalnih brojeva.

1.) $3{\cdot}74020\ldots \times 7{\cdot}34$

$3{\cdot}74020$
437
$\overline{2618\,14}$
11221
1496
$\overline{27{\cdot}4531}$

2.) $72{\cdot}45\,36 \times 6{\cdot}238$

$72{\cdot}45\,36$
8326
$\overline{434\,7216}$
144907
21736
5796
$\overline{451{\cdot}9655}$

3.) $4{\cdot}73824 \times 372{\cdot}345$

$4{\cdot}73824$
543273
$\overline{142\,15}$
3317
95
14
2
$\overline{1764{\cdot}2}$

4.) $0{\cdot}006347\ldots \times 38{\cdot}3476$

$0{\cdot}006347$
674383
$\overline{1904}$
507
19
2
$\overline{0{\cdot}2432}$

5.) $57{\cdot}43827\ldots \times 5457$

$57{\cdot}43827$
7543
$\overline{172314}$
22975
2872
402
$\overline{1985{\cdot}63}$

6.) $0{\cdot}349572\ldots \times 0{\cdot}4376$

$0{\cdot}349572$
67340
$\overline{139829}$
10487
2447
209
$\overline{0{\cdot}152973}$

7.) a.) $\frac{5}{7} \times 248{\cdot}35 = 0{\cdot}714285\ldots \times 248{\cdot}35$

$0{\cdot}714285$
53842
$\overline{142857}$
28571
5714
214
36
$\overline{177{\cdot}392}$

b.) $0{\cdot}37 \times 72{\cdot}65$

$0{\cdot}373737$
5627
$\overline{261616}$
7475
2242
186
$\overline{27{\cdot}1514}$

c.) $2{\cdot}047 \times 0{\cdot}3284$

$2{\cdot}04747$
4823
$\overline{6142}$
409
163
8
$\overline{0{\cdot}6722}$

d.) $\frac{6}{11} \times \frac{23}{32} = 0{\cdot}54 \times 0{\cdot}71875$

$0{\cdot}5454$
57817
$\overline{3818}$
55
43
4
$\overline{0{\cdot}3920}$

8.) $72{\cdot}54\ldots \times 245{\cdot}342\ldots$

$245{\cdot}342$
4527
$\overline{1717\,3940}$
490684
122671
9814
$\overline{1779{\cdot}7109}$

9.) $43{\cdot}5637\ldots \times 7{\cdot}263\ldots$

$43{\cdot}5637$
3627
$\overline{304\,9459}$
87127
26138
1307
$\overline{316{\cdot}4031}$

10.) $532{\cdot}48\ldots \times 7354{\cdot}278\ldots$

$7354{\cdot}278$
84235
$\overline{3677\,13900}$
$2206\,2834$
$147085\,6$
$29417\,1$
$5883\,4$
$\overline{3916{\cdot}0595}$

11.) $0{\cdot}25784\ldots \times 4{\cdot}48$

$0{\cdot}25784$
844
$\overline{10312}$
1031
206
$\overline{1{\cdot}1559}$

12.) $572{\cdot}384 \times 3{\cdot}14149\ldots$

$572{\cdot}384$
951413
$\overline{1717\,1520}$
572384
228954
5724
2262
515
$\overline{1798{\cdot}1759}$

13.) $0{\cdot}0736 \times 26{\cdot}367\ldots$

$0{\cdot}0736$
76362
$\overline{14720}$
4416
221
44
5
$\overline{1{\cdot}9466}$

14.) 0·0843... x 0·074263...

0·074263
348

594
30
2

0·0626

15.) 2437·5783... x 5·8023

2437·5783
32085

12187891 5
19500626
48751
7313

14143·5505

16.) 6·357... x 5·8023...

6·357
32085

317850
50856
127
19

36·8852

17.) 428·63... x 528·63...

428·63
36825

2143 1500
856260
343104
25718
1286

2265·7868

§ 47. Skraćeno dijeljenje.

1.) 74·38026 : 4·54732 = 16·59

2891
263
36
==

2.) 5038·247 : 68·32546 = 75·202

35546
1383
17
3

3.) 26·58347 : 0·63700 = 41·732

265·8347 : 6·3700 = 41·732
11034
4664
205
14

4.) 0·73824 : 2·34275 = 0·3151

=354
120
==3
1

5.) 0·635025 : 37·43 = 0·01696

2607
301
24
2

6.) 0·048372 : 542·7 = 0·0000891

493
==6
1

7.) 0·008356 : 0·0473 =

0·8356 : 4·730 = 0·1766
3626
315
31
3

8.) 376·8539 : 0·00637 =

376853·9 : 6·3700 = 59160·—
58353
1023
386
==4

9.) 438·07 : 0·635 =

4380·70 : 6·3563 = 689·19
56692
5842
122
60
3

10.) 14 : 0·73562 =

14000 : 7·3562 = 19·03
6644
24
2

11.) 1 : 0·3254 =

10000 : 3·254 = 3·073
238
10

12.) 96360 : 859·4367 = 112·12
10416
1822
163
17

13.) 499·86 : 526·38 = 0·949
261
57
4

14.) 625·750 : 1·17000 = 536·026
40750
7050
30
7

15.) 1000 : 4·175 =
10000000 : 4175000 = 239·5164
1650000
397500
21750
685
267
17
1

Dijeljenje nepotpunih brojeva.

1) 847·56... : 28·3 = 29·949
oo
28156
2686
139
26
1

2.) 0·7345... : 7·4653 = 0·0983
626
29
7

3) 0·042957... : 0·328 = 0·0112245
oo
4757
931
173
20
1

4.) 749·5 : 32·5283... = 23·04
989
13
= =

5.) 0·4356 : 0·853... = 0·0510
= = 41
= 6

6.) 754053... : 2·348... = 32·1147
oo
49653
2693
345
110
16
= =

7.) 2743·28... : 83·245... = 32·954
24593
7944
452
36
3

8.) 0·823457... : 0·2834... = 2·90563
oo
256657
1597
180
10
2

9.) 0·054634... : 0·0735... = 0·007133
o
3184
244
23
1

10.) 0·7356... : 23·74... = 0·03099
234
21
= =

Primjeri izostavljena radi jednostavne izradbe.

Opća aritmetika.

§48. Opći brojevi.

1.) a.) $20-(6+5)=20-11=9$

b.) $18-(7-3)=18-4=14$

c.) $45-3(7+4)=45-3\cdot 11=45-33=12$

d.) $45-(3\cdot 7+4)=45-(21+4)=45-25=20$

e.) $(45-3)\cdot 7+4=42\cdot 7+4=294+4=298$

f.) $(45-3)(7+4)=42\cdot 11=462$

g.) $(10-4):2=6:2=3$

h.) $10-4:2=10-2=8$

i.) $44-16:(7-3)=44-16:4=44-4=40$

k.) $(44-16):7-3=28:7-3=4-3=1$

l.) $(44-16):(7-3)=28:4=7$

2.) a.) $20-(18-5)-(2+3)=20-13-5=7-5=2$

b.) $20-[18-(5-2)+3]=20-[18-3+3]=2$

c.) $20-[18-\{5-(2+3)\}]=20-[18-(5-5)]=20-[18-0]=2$

d.) $20-[(18-5)-(2+3)]=20-[13-5]=20-8=12$

e.) $20-[18-(5-2+3)]=20-[18-6]=20-12=8$

3.) a.) $42-(24:4-2)+4\cdot 3:6-2=42-(6-2)+2-2=$
$42-4=38$

b.) $(42-24):(4-2)+4\cdot 3:(6-2)=18:2+12:4=$
$9+3=12$

c.) $[(42-24):(4-2+4)]\cdot 3:(6-2)=[18:6]\cdot 3:4=$
$=3\cdot 3:4=9:4=\frac{9}{4}$

d.) $[42-(24:4-2+4)\cdot 3]:(6-2)=[42-(6-2+4)\cdot 3]:4=$
$[42-8\cdot 3]:4=18:4=\frac{18}{4}=\frac{9}{2}$

e.) $(42-24):[(4-2)+4\cdot 3:(6-2)]=18:[2+12:4]=$
$=18:[2+3]=18:5=\frac{18}{5}$

4.) a.) $5\cdot 6\cdot 8:4=5\cdot 6\cdot 2=60$

b.) $5\cdot(6\cdot 8:4)=5\cdot 6\cdot 8:4=5\cdot 6\cdot 2=60$

c.) $5\cdot 6\cdot(8:4)=5\cdot 6\cdot 8:4=5\cdot 6\cdot 2=60$

5.) Ne smije, jer je inače $a+bx$ mjesto $(a+b)x$ t.j. mjesto: ž.broj od a i b ima se pomnožiti sa x, glasi izraz: broju a ima se pribrojiti produkat od b i x. Isto je $a:b+c$ mjesto $a:(b+c)$ t.j. mjesto: broj a ima se podijeliti sa ž.brojem od b i c glasi izraz: kvocijentu od a i b ima se pribrojiti broj c.

6.) $(a+b)m$ 7.) $(a+b)(a+b)$

8.) $(m+n)(m-n)$

9.) Prvi izraz glasi: razlika od a i b množi se sa razlikom od c i d.

Drugi izraz glasi: Od produkta broja c i razlike od a i b ima se odbiti broj c.

Treći izraz glasi: od broja a ima se odbiti produkat od broja b i razlike od c i d.

Četvrti izraz glasi od broja a ima se odbiti produkat od b i c i broj d.

10.) $100-(8+3)\cdot 5=100-55=45$

11.) $5-[10-(12-4)=5-[10-8]=5-2=3$

Vježbe II.

1.) a.) $4n+2=4\cdot 16+2=64+2=66$

b.) $2n+\frac{n-1}{3}=2\cdot 16+\frac{16-1}{3}=32+5=37$

c.) $\frac{n}{4}+5n = \frac{16}{4}+5\cdot16 = 4+80 = 84$

2.) a.) $a-(b-c) = 13-(3-1) = 13-2 = 11$

b.) $ab-a(a-c) = 13\cdot3-13(13-1) = 39-13\cdot12 = 39-156 = -117$.

c.) $(a-b)(b-c) = (13-3)(3-1) = 10\cdot2 = 20$

d.) $a:b-b:c = 13:3-3:1 = \frac{13}{3}-3 = \frac{4}{3}$

e.) $a(a-b+c) = 13(13-3+1) = 13\cdot11 = 143$

f.) $a(b-c)+b(a-c) = 13(3-1)+3(13-1) = 13\cdot2+3\cdot12 = 62$

g.) $ab-bc+ac = 13\cdot3-3\cdot1+13\cdot1 = 39-3+13 = 49$

h.) $(ab-c)(ac-b) = (13\cdot3-1)(13\cdot1-3) = 38\cdot10 = 380$

i.) $a[(a-c)+b]:b = 13[(13-1)+3]:3 = 13[12+3]:3 = 13\cdot15:3 = 13\cdot5 = 65$

3.) $(a:b):c = (16:4):2 = 4:2 = 2$

$a:(b:c) = 16:(4:2) = 16:2 = 8$

4.) a.) $x-[(a-b)(m-n)] = 15-[(15-7)(4-2)] = 15-[8\cdot2] = 15-16 = -1$

b.) $x-[a-(b-m-n)] = 15-[15-(7-4-2)] = 15-[15-1] = 15-14 = 1$

c.) $x-[a-(b-m)-n] = 15-[15-(7-4)-2] = 15-[13-3] = 15-10 = 5$

d.) $x-[(a-b-m)-n] = 15-[(15-7-4)-2] = 15-[4-2] = 15-2 = 13$

5.) $\frac{a+b+c}{m-n}\cdot d = \frac{1+12+11}{48-18}\cdot5 = \frac{24}{30}\cdot5 = \frac{24}{6} = 4$

6.) a.) $ab:c = 108\cdot12:6 = 108\cdot2 = 216$

b.) $ab:cd = 108\cdot12:6\cdot2 = 108$

c.) $a\cdot\frac{b}{ca} = \frac{a\cdot b}{c\cdot a} = 108$ (vidi isti zad. b.)

d.) $(a:b):(c:d) = (108:12):(6:2) = 9:3 = 3$

7.) a.) $\frac{abc}{d:e} = \frac{30\cdot10\cdot5}{8:4} = \frac{30\cdot10\cdot5}{2} = 30\cdot5\cdot5 = 750$

b.) $\frac{ab}{c}:\frac{de}{m} = \frac{30\cdot10}{5}:\frac{8\cdot4}{16} = 60:2 = 30$

8.) Na 1kg dobije $b-a$, a na c kg $c(b-a)$

" " " $5\cdot10-4\cdot8 = 0\cdot3$

na 80kg dobije $80(5\cdot10-4\cdot8) = 80\cdot0\cdot3 = 24$

9.) Za b kg dobio je bc K. Ostalo mu je $(a-b)$ kg robe. Za taj ostatak dobio je $(a-b)d$ K; u svemu je dakle dobio: $bc+(a-b)d = 100\cdot8+(500-100)\cdot6 = 800+2400 = 3200$ K

10.) $a-6b-c = 32-6\cdot3-7 = 7$

Prijatelji 7 K

11.) Vrijednost od a hl po c K je ac K.

" " b " " d " " bd K

Potome je vrijednost pomiješe od $(a+b)$ hl $(ac+bd)$ K

1 hl stoji $\frac{ac+bd}{a+b} = \frac{30\cdot36+8\cdot50}{30+8} = 38\cdot94$ K.

I. Zbrajanje i oduzimanje.

§ 49. Zbrajanje općih brojeva.

1.) $a+a = 2a$ 2.) $b+b = 2b$ 3.) $3x+x = 4x$

4.) $3m+2m = 5m$ 5.) $7p+3p = 10p$

6.) $4y+y+7y = 12y$ 7.) $2a+3a+5a+8a = 18a$

8.) $8\cdot25a + 5\cdot5a + 3\cdot75a = 17.50a$

9.) $\frac{1}{2}x + \frac{3}{4}x + \frac{4}{5}x = \frac{10}{20}x + \frac{15}{20}x + \frac{16}{20}x = \frac{41x}{20}$

10.) Tanca su četiri broja: $n+4$, $n+5$, $n+6$ i $n+7$.

Njihov je zbroj: $n+4+n+5+n+6+n+7 = 4n+22$

a.) $4n+22 = 26$ (za $n=1$)

b.) $4n+22 = 42$ (za $n=5$)

11.) $(a+3)+4 = a+3+4 = a+7$

12.) $(3x+5)+4x = 3x+5+4x = 7x+5$

13.) $(5x+3a)+6x = 5x+3a+6x = 11x+3a$

14.) $(5b+2y)+3b = 5b+2y+3b = 8b+2y$

15.) 11.) $a+7 = 6+7 = 13$

12.) $7x+5 = 7\cdot4+5 = 28+5 = 33$

13.) $11x+3a = 11\cdot4+3\cdot6 = 44+18 = 62$

14.) $8b+2y = 8\cdot3+2\cdot2 = 24+4 = 28$

16.)
$$\begin{array}{r} a+4b+3a \\ \underline{3a+2b+a\ +} \\ 4a+6b+4a = 8a+6b \end{array}$$

17.) $[(3x+14y)+2x]+5y = [3x+14y+2x]+5y =$
$= 5x+14y+5y = 5x+19y$

18.) $[(4a+3b)+5a]+6b = [4a+3b+5a]+6b =$
$4a+3b+5a+6b = 9a+9b$

19.) $(5x+3)+(2x+4) = 5x+3+2x+4 = 7x+7$

20.) $(3a+2b+4c)+(8a+5b) = 3a+2b+4c+8a+5b =$
$= 11a+7b+4c$

21.) $(3a+2b)+(9a+8b) = 3a+2b+9a+8b =$
$= 12a+10b$

22.)
$$\begin{array}{r} 2a+5b+8c \\ \underline{10a+7b+4c\ +} \\ 12a+12b+12c \end{array}$$

23.)
$$\begin{array}{r} 0{\cdot}6a+0{\cdot}26b \\ \underline{0{\cdot}3a+1{\cdot}6b\ +} \\ 0{\cdot}9a+1{\cdot}86b \end{array}$$

24.)
$$\begin{array}{r} \frac{2}{3}x+\frac{3}{4}y \\ \underline{\frac{1}{2}x+\frac{1}{3}y\ +} \\ \frac{7}{6}x+\frac{13}{12}y \end{array}$$

25.)
$$\begin{array}{r} 3a+4b+5c+d \\ 2a+b+6c+3d\ + \\ \underline{8a+6b+2c+4d} \\ 13a+11b+13c+8d = \end{array}$$
$= 13\cdot2+11\cdot3+13\cdot1+8\cdot4 = 104$

26.)
$$\begin{array}{r} 3x+4y+2z \\ 4y+3z+2w \\ 6x+2y\quad +3w\ + \\ \underline{x\quad +4z+u} \\ 10x+10y+9z+6w \end{array}$$

§50. Oduzimanje općih brojeva.

1.) $6a-2a = 4a$ 2.) $8x-5x = 3x$ 3.) $12m-m = 11m$

4.) $6\cdot3x-2\cdot4x = 3\cdot9x$ 5.) $\frac{2}{3}a-\frac{1}{4}a = \frac{8}{12}a-\frac{3}{12}a = \frac{5}{12}a$

6.) $5m+6m-8m = 11m-8m = 3m$

7.) $6b-3b+6b = 3b+6b = 9b$

8.) $8x+7x-9x+2x = 8x$

9.) $20m-5m-6m-2m = 7m$

10.) $3\cdot6a-2\cdot7a+1\cdot8a = 5\cdot4a-2\cdot7a = 2\cdot7a$

11.) $\frac{3}{4}x+\frac{5}{8}x-\frac{2}{3}x-\frac{1}{6}x = \frac{18}{24}x+\frac{15}{24}x-\frac{16}{24}x-\frac{4}{24}x = \frac{13}{24}x$

12.) $5m+10n-2m-6n+3m-n = 6m+3n$

13.) Prethodnica četiri broja zovu se:
$n+4$, $n+3$, $n+2$ i $n+1$.

14.) $(m+6)-2 = m+6-2 = m+4$

15.) $(9x+5y)-4x = 9x+5y-4x = 5x+5y$

16.) $(x-4)+3x = x-4+3x = 4x-4$

17.) $8x-(2x+6) = 8x-2x-6 = 6x-6$

18.) $8m-(3n+m) = 8m-3n-m = 7m-3n$

19.) $5m-(8-2m)=5m-8+2m=7m-8$

20.) $20-(15-4m)=20-15+4m=5+4m$

21.) $(14x+13y)-(12x+3y)=14x+13y-12x-3y=2x+10y$

22.) $5a+3b-(4a+6b)=5a+3b-4a-6b=a-3b$

23.) $7m+2n-(6m-3n)+(m+2n)=7m+2n-$
$-6m+3n+m+2n=2m+7n$

24.) a.) $\begin{array}{r} 3a+6b \\ -(2a+4b) \\ \hline a+2b \end{array}$ b.) $\begin{array}{r} 12m+8n \\ -(8m-6n) \\ \hline 4m+14n \end{array}$

c.) $\begin{array}{r} 6a-5b \\ -(2a+b) \\ \hline 4a-6b \end{array}$ d.) $\begin{array}{r} 15x+5y \\ -(12x-3y) \\ \hline 3x+8y \end{array}$

25.) a.) $\begin{array}{r} 9a+8b-7c \\ -(2a-8b-16c) \\ \hline 7a+16b+9c \end{array}$ b.) $\begin{array}{r} 23a-26b+19c-7d \\ -(18a+14b-c+8d) \\ \hline 5a-40b+20c-15d \end{array}$

26.) $17a+5b-(7a+b)-[3a-(2a-b)]=$
$=17a+5b-7a-b-[3a-2a+b]=$
$=10a+4b-3a+2a-b=9a+3b$

27.) $(15m+12n)-[(4m+n)-(3m-n)]=$
$=15m+12n-[4m+n-3m+n]=$
$=15m+12n-4m-n+3m-n=14m+10n$

28.) $8x+5y-[(4x+3)-(2x+4y)]-(2x+1)=$
$=8x+5y-[4x+3-2x-4y]-2x-1=$
$=6x+5y-1-4x-3+2x+4y=4x+9y-4$

29.) $16a-5b-(2b+3c-2)-(15a-4b-5c+3)=$
$=16a-5b-2b-3c+2-15a+4b+5c-3=$
$=a-3b+2c-1$

30.) $12m-19n+(8m-7n)-[17m-3n+(2n-6m)]=$
$=12m-19n+8m-7n-[17m-3n+2n-6m]=$

$20m-26n-17m+3n-2n+6m=9m-25n$

31.) a.) $10x-8y-(6x-4y)-(2x+y)=$
$=10x-8y-6x+4y-2x-y=2x-5y=16-30=-14$

b.) $10x-8y-[6x-(4y-2x)]+y=$
$=10x-8y-[6x-4y+2x]+y=10x-7y-6x+4y-2x=$
$=2x-3y=16-18=-2$

c.) $10x-(8y-6x)-[4y-(2x+y)]=$
$=10x-8y+6x-[4y-2x-y]=$
$=16x-8y-4y+2x+y=18x-11y=144-66=78$

d.) $10x-[8y-(6x-4y)]-(2x+y)=10x-[8y-6x+4y]-$
$-2x-y=8x-y-8y+6x-4y=14x-13y=112-78=34$

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§ 52. Zbrajanje algebarskih brojeva.

1.) $(+8)+(+5)=8+5=13$ 2.) $7+(-6)=7-6=1$

3.) $93+(-145)=93-145=52$ 4.) $9+(-9)=9-9=0$

5.) $(+148)+(-87)=148-87=61$

6.) $(-12)+(-17)=-12-17=-29$

7.) $(-38)+(+17)=-38+17=-21$

8.) $(-26)+(+49)=-26+49=23$

9.) $(+15a)+(+6a)=15a+6a=21a$

10.) $9m+(-6m)=9m-6m=3m$

11.) $18m+(-24m)=18m-24m=-6m$

12.) $(-13x)+(+8x)=-13x+8x=-5x$

13.) $(-158x)+(+73x)=-158x+73x=-85x$

14.) $-27y+(+27y)=-27y+27y=0$

15.) $a+(+m)=a+m$

16.) $\quad(-5)=a-5$

17.) $-15x+(-16y)=-15x-16y$

18.) $5(a+b)+[-6(a+b)]=5a+5b-6(a+b)=$
$5a+5b-6a-6b=-a-b$

19.) $-3(x+y)+[-8(x+y)]=-3x-3y-8(x+y)=$
$=-3x-3y-8x-8y=-11x-11y$

20.) a.) $(+16K)+(+24K)=+40K$
b.) $(+18K)+(-5K)=18K-5K=13K$
c.) $(+24K)+(-32K)=24K-32K=-8K$
d.) $(-12K)+(-15K)=-12K-15K=-27K$

21.) a.) $(+532m)+(-384m)=+148m$ nad oplom
b.) $(+427m)+(-593m)=427m-593m=-116m$

22.) $(-453g)+(+243g)=-210g$ prije J.
$(-453g)+(+628g)=+175g$ poslije J.

§ 53. Oduzimanje algebarskih brojeva.

1.) $(+15)-(+18)=15-18=-3$
2.) $(+24)-(-13)=24+13=37$
3.) $(-32)-(-45)=-32+45=13$
4.) $(-17)-(-17)=-17+17=0$
5.) $(+2\frac{3}{4})-(+3\frac{1}{2})=2\frac{3}{4}-3\frac{1}{2}=\frac{11}{4}-\frac{7}{2}=\frac{11}{4}-\frac{14}{4}=-\frac{3}{4}$
6.) $(+7a)-(-2a)=7a+2a=9a$
7.) $12-(+4b)=12-4b$
8.) $(-5a)-(-8a)=-5a+8a=3a$
9.) $(-9x)-(+12x)=-9x-12x=-21x$
10.) $(+5a)+(-8)-(+5)=5a-8-5=5a-13$
11.) $(-34)+(+27)-(-32)-(+18)=-34+27+32-18=7$
12.) $(-4a)+(-2a)-(-a)+(+9a)=-4a-2a+a+9a=4a$
13.) $(-9x)+(-x)-(-5x)-(-6x)=-9x-x+5x+6x=x$

14.) $(+1894)-(+1863)=1894-1863=31g$
Od godine smrti oduzimamo god. rođenja.

15.) $(+14)-(-63)=14+63=77g$

16.) $(+321)-(-385)=-321+385=64g$

17.) $(+7°)-(-2°)=7°+2°=9°$

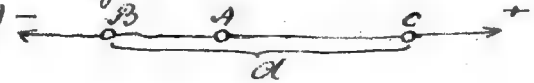
18.) Prešao je u vremenu: $340m+85m+430m+570m=1425m$
Nalazište u visini od zemlje:
$(+340m)+(-85m)+(+430m)+(-570m)=$
$=340m-85m+430m-570m=+115m$

19.) a.)

C je mjesto, gdje će kititi prvi parobrod za 1 min.
B " " " " " drugi " " " "
Dalјina je od potome $= AC-AB$, ako su AC i AB puteri što ih parobrodi prevale za 1 min. $d=230m-158m=72m$

Isto tako zaključi za udaljenost parobroda iz $\frac{1}{2}h=30$ min. Za to je vrijeme svaki parobrod prevalio 30 puta veći put nego za 1 min. Prema tome prevalio je prvi parobrod $30.230m$, a drugi $30.158m$. Udaljenost njihova jednaka je $d=30.230m-30.158m=2160m$

b.)



Desni smjer neka je pozitivan, lijevi negativan. Udaljenost je jednaka $d=$
$=(+AC)-(-AB)=AC+AB$ ako su AC i AB

putevi prevaljeni u jednoj minuti.
d je potome = 230 m + 158 m = 388 m
Za $\frac{1}{2}$ h zaključi kao u zadatku a.)
d = (+30 . 230) - (-30 . 158) = 11640 m
20.) $(+70\frac{2}{3}°) - (+45\frac{5}{6}°) = 70\frac{2}{3} - 45\frac{5}{6} = 24\frac{5}{6}°$
Primjedba: sjeverna širina neka je pozitivna, južna negativna.
21.) $(+48\frac{1}{5}°) - (-33\frac{9}{10}°) = 48\frac{1}{5} + 33\frac{9}{10} = 82\frac{1}{10}°$
22.) $(+52) + [(-34) - (-12)] = 52 + [-34 + 12] =$
$= 52 + [-22] = 52 - 22 = 30$
23.) $(-15) - [(+12) - (-8)] = -15 - [12 + 8] = -15 - [+20] =$
$= -15 - 20 = -35$
24.) $(-3a + 4b + 2c) - (-7a - 2b + 3c) =$
$= -3a + 4b + 2c + 7a + 2b - 3c = 4a + 6b - c =$
$= 8 + 24 - 6 = 26$
Pokus: $(-6 + 16 + 12) - (-14 - 8 + 18) = 22 + 4 = 26$
25.) $(5x - y + 2z) - (3x - y - 4z) - (-2x + 3y - 6z) =$
$= 5x - y + 2z - 3x + y + 4z + 2x - 3y + 6z =$
$= 4x - 3y + 12z = 4 - 6 + 36 = 34$
Pokus: $(5 - 2 + 6) - (3 - 2 - 12) - (-2 + 6 - 18) =$
$= 9 + 11 + 14 = 34$
26.) $a - (b - c) - [c - (b - a)] = a - b + c - c + (b - a) =$
$= a - b + c - c + b - a = 0$
Pokus: $-2 - [1 - (-1)] - \{-1 - [1 - (-2)]\} =$
$= -2 - [1 + 1] - \{-1 - [1 + 2]\} = -2 - 2 + 1 + 3 = 0$
27.) $5x - [2y + (3x - 4y) - (x - 2y)] =$
$5x - 2y - (3x - 4y) + (x - 2y) =$
$= 5x - 2y - 3x + 4y + x - 2y = 3x = 9$
Pokus: $15 - [2 + (9 - 4) - (3 - 2)] = 15 - 2 - 5 + 1 = 9$

28.) $2x + y - \{5y + [2x - (3y - 2x)]\} =$
$= 2x + y - 5y - [2x - (3y - 2x)] =$
$= 2x - 4y - 2x + (3y - 2x) = -4y + 3y - 2x =$
$= -y - 2x = -2 - 8 = -10$
29.) $a + \{(a - b) - [a - (3a + b)]\} =$
$= a + (a - b) - [a - (3a + b)] =$
$= a + a - b - a + (3a + b) = a - b + 3a + b =$
$4a = 4$
Pokus: $1 + \{(1 - 2) - [1 - (3 + 2)]\} = 1 + (-1) - [1 - 5] =$
$= 1 - 1 - (-4) = 4$
30.) $2m - \{m + n + [2m - (n + 5m)] + 4m\} =$
$= 2m - m - n - [2m - n - 5m] - 4m =$
$= -3m - n - 2m + n + 5m = 0$
Pokus: $4 - \{2 - 2 + [4 - (-2 + 10)] + 8\} =$
$= 4 - [4 - 8] - 8 = -4 + 4 = 0$

II. Množenje i dijeljenje.

§. 54. Množenje monoma.

1.) $5a \cdot 3 = 15a$ 2.) $6a \cdot x = 6ax$ 3.) $m \cdot 6n = 6mn$
4.) $5x \cdot 3y = 15xy$ 5.) $4ab \cdot 3 = 12ab$ 6.) $7m \cdot 3n = 21mn$
7.) $8ab \cdot 3c = 24abc$ 8.) $7y \cdot y \cdot 3 = 21y^2$
9.) $3a \cdot 4b \cdot 5c = 60abc$ 10.) $a^4 \cdot a^7 = a^{11}$
11.) $x^5 \cdot x = x^6$ 12.) $m^5 \cdot m^3 = m^8$
13.) $2m^3 \cdot 2m^3 = 4m^6$ 14.) $5x^2 \cdot 2x^3 = 10x^5$
15.) $ax^2 \cdot x^2 = ax^4$ 16.) $2ab \cdot 2ab = 4a^2b^2$
17.) $4a^2c \cdot 3a^3 = 12a^5c$ 18.) $5a^2b \cdot 3ab^3 = 15a^3b^4$

19.) $5xy \cdot 8yz = 40xy^2z$

20.) $4m^2n \cdot 5mx^2y^3 = 20m^3nx^2y^3$

21.) $9\frac{1}{3}ax^2y \cdot 6\frac{1}{2}ay^2 = \frac{28}{3}ax^2y \cdot \frac{13}{2}ay^2 = \frac{364}{6}a^2x^2y^2$

22.) $3ax \cdot 5by \cdot 2ab = 30a^2b^2xy$

23.) $4a^2 \cdot 5a^3 \cdot 3a^4 = 60a^9$

24.) $6a^3 \cdot 5x^2 \cdot ax = 30a^4x^3$

25.) $3m^2n \cdot 2m^2n^2 \cdot 4mn^3 = 24m^5n^6$

26.) $5x^3y^2z \cdot 7x \cdot 3x^2y = 105x^6y^3z$

27.) $6a \cdot 3b \cdot 5am \cdot 2bm = 180a^2b^2mn$

28.) $8x^2y^3 \cdot 4x^4z \cdot y^3z^5 = 32x^6y^6z^6$

29.) $ab^2c^3 \cdot 2a^2bd^2 \cdot 3c^3d^4 = 6a^3b^3c^6d^6$

30.) Možemo ovo:

$2abc + 4a^2m + 5am^2 + 2a^2m + 3am^2 =$

$= 2abc + 6a^2m + 8am^2$

31.) a.) $5ab - m + 7ab + ab + 6m - 5ab = 8ab + 5m$

b.) $3a^2b + 4ab^2 + 6a^2b = 9a^2b + 4ab^2$

c.) $6ac + 3bc - 3abc - 2bc + abc + 3bc =$

$= 6ac + 4bc - 2abc$

d.) $x^2y + 5xy - 2x^2y - 3xy^2 = -x^2y + 5xy - 3xy^2$

e.) $a^3 + 2a^2b - 3ab^2 - a^2b + ab^2 + 2a^3 =$

$= 3a^3 + a^2b - 2ab^2 = 3 \cdot 8 + 4 \cdot 4 - 2 \cdot 2 \cdot 16 = -24$

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§.55. Množenje binoma

I. Vježbe.

1.) $(6+4) \cdot 2 = 10 \cdot 2 = 20$; $(6+4) \cdot 2 = 12 + 8 = 20$

2.) $(100-4) \cdot 6 = 600 - 24 = 576$

3.) $(a+2) \cdot 5 = 5a + 10$

4.) $(x-8) \cdot y = xy - 8y$

5.) $(a+bc)c = ac + bc^2$

6.) $(a-3x)ax = a^2x - 3ax^2$

7.) $(2a^2-b)a^3 = 2a^5 - a^3b$

8.) $(4x^3y+5)2x^4 = 8x^7y + 10x^4$

9.) $[(2x-5y)+4a]3ax^2 = 3ax^2(2x-5y) + 12a^2x^2 =$

$= 6ax^3 - 15ax^2y + 12a^2x^2$

10.) $[5a-(4ab-b)]8ab = 40a^2b - 8ab(4ab-b) =$

$= 40a^2b - 32a^2b^2 + 8ab^2$

11.) $(a+b+c) \cdot 3 = 3a + 3b + 3c$

12.) $(a-b+c) \cdot 4 = 4a - 4b + 4c$

13.) $(b-2a-3x)2ax = 2abx - 4a^2x - 6ax^2$

14.) $(a^2-2ab+b^2)2a^3b^2 = 2a^5b^2 - 4a^4b^3 + 2a^3b^4$

15.) $(9a^3-7a^2+5a-3)5a^6 = 45a^9 - 35a^8 + 25a^7 - 15a^6$

II. Vježbe

1.)
$$\begin{array}{r} (2a+b)(3a+2b) \\ \hline 6a^2+3ab \\ \quad +4ab+2b^2 \\ \hline 6a^2+7ab+2b^2 \end{array}$$

2.) $(x+3)(y+2) = xy + 3y + 2x + 6$

3.)
$$\begin{array}{r} (3x+4y)(5x+6y) \\ \hline 15x^2+20xy \\ \quad +18xy+24y^2 \\ \hline 15x^2+38xy+24y^2 \end{array}$$

4.) $(2m+4n)(5-6x) = 10m + 20n - 12mx - 24nx$

5.) $(4x-5)(3y+z) = 12xy - 15y + 4xz - 5z$

6.) $(7x-6y)(4a+3b) = 28ax - 24ay + 21bx - 18by$

7.) $(2a-b)(m-n) = 2am - bm - 2an + bn$

8.)
$$\begin{array}{r} (3a-2b)(2a-b) \\ \hline 6a^2-4ab \\ \quad -3ab+2b^2 \\ \hline 6a^2-7ab+2b^2 \end{array}$$

9.) $(x-2m)(2x-m)$

$$\begin{array}{r} 2x^2-4mx \\ -mx+2m^2 \\ \hline 2x^2-4mx+2m^2 \end{array}$$

10) $(5a-4b)(3a-2b)$

$$\begin{array}{r} 15a^2-12ab \\ -10ab+8b^2 \\ \hline 15a^2-22ab+8b^2 \end{array}$$

11.) $(5m^2-6n^2)(3m-2n)=15m^3-18mn^2-10m^2n+12n^3$

12.) $(a+3b)^2=a^2+6ab+9b^2$

13.) $(x+4)^2=x^2+8x+16$

14.) $(30+5)^2=900+300+25=1225$

15.) $(3x-4)^2=9x^2-24x+16$

16.) $(2a-3b)^2=4a^2-12ab+9b^2$

17.) $(6m-5n)^2=36m^2-60mn+25n^2$

18.) $(7x-2y)^2=49x^2-28xy+4y^2$

19.) $(5-3x)^2=25-30x+9x^2$

20.) $(50-4)^2=50^2-2\cdot50\cdot4+4^2=2116$

21.) $(2a+b)(2a-b)=4a^2-b^2$ Pogledaj prav. u knjizi!

22.) $(3x+4y)(3x-4y)=9x^2-16y^2$ " "

23.) $(8m+5n)(8m-5n)=64m^2-25n^2$ " "

24.) $(m+1)(m+2)(m+3)=(m^2+3m+2)(m+3)=$
$=m^3+6m^2+11m+6$

$(m+1)(m+2)$

$$\begin{array}{r} m^2+m \\ +2m+2 \\ \hline m^2+3m+2 \end{array}$$

$(m^2+3m+2)(m+3)$

$$\begin{array}{r} m^3+3m^2+2m \\ +3m^2+9m+6 \\ \hline m^3+6m^2+11m+6 \end{array}$$

25.) $(x+a)^3+(x-a)^3=(x+a)^2(x+a)+(x-a)^2(x-a)=$
$=(x^2+2ax+a^2)(x+a)+(x^2-2ax+a^2)(x-a)=$
$=x^3+3x^2a+3xa^2+a^3+x^3-3x^2a+3xa^2-a^3=$
$=2x^3+6ax^2$

26.) $[(a+b)+c]^2=(a+b)^2+2(a+b)c+c^2=$
$a^2+2ab+b^2+2ac+2bc+c^2$

III. Vježbe

1.) $(+3)(+4)=+12$ 2.) $(+5)(-2)=-10$

3.) $(-5)(+8)=-40$ 4.) $(-3)(-6)=+18$

5.) $(+2a)(+m)=+2am$ 6.) $(-3x)(+2y)=-6xy$

7.) $(-4x)(-5y)=+20xy$

8.) $(-2m)(8n)=-16mn$

9.) $3ab(-4a^2b)=-12a^3b^2$

10.) $(-6xy)(-3ax)=+18ax^2y$

11.) $(-2\frac{3}{5}abx)(8bx^2x^3)=(-\frac{13}{5}abx)8bx^5=$
$=-\frac{104}{5}ab^2x^6$

12.) Kod trećeg produkta ima valjda tiskarska pogrješka kod predznaka (u izdanju od 1913) svi su produkti negativni.

Pravilo: ako je broj negativnih faktora tak, produkat je pozitivan (jer dva i dva negativna faktora daju pozitivan produkat). Ako je broj negativnih faktora lih, produkat je negativan.

13.) $(-x)(-2y)(+z)=2xyz$

14.) $(-a)(-a)(+a)=a^3$

15.) $(-5a)(+4a)(-3b)=60a^2b$

16.) $2a(-2b)(+a)(-b)=4a^2b^2$

17.) $(-2a)(-2b)(+a)(-b)=-4a^2b^2$

18.) $(-6a)(-3ax)\,5b\cdot2by=180a^2b^2xy$

19.) $(-3)(-7a^2)\,9a^3\cdot5a=21a^2\cdot45a^4=945a^6$

20.) $(-x^3)(-x^2y)(-2xy)(-2x^2)=4x^8y^2$

21.) $[a+(-b)](+a)=+a^2+(-ab)=a^2-ab$

22.) $[a+(+b)](-a)=-a^2+(-ab)=-a^2-ab$

§56. Množenje polinoma.

1.) $(4a-8b+3c)2m = 8am-16bm+6cm$

2.) $(9x-7y-3z)(-6a) = -54ax+42ay+18az$

3.) $(3m^2-6m+1)(-1) = -3m^2+6m-1$

4.) $(-4x^2-7x-5)(3x) = -12x^3-21x^2-15x$

5.) $-7a(-5a^3-9a^2+6a-2) = +35a^4+63a^3-42a^2+14a$

6.) $(2x^2-7xy-12y^2)5x^2y = 10x^4y-35x^3y^2-60x^2y^3$

7.) $(-3a^2+5ab-4b^2)6ab^2+(2a^3-3a^2b+7ab^2-5b^3)9b^2 =$
$= -18a^3b^2+30a^2b^3-24ab^4+18a^3b^2-27a^2b^3+$
$+63ab^4-45b^5 = 3a^2b^3+39ab^4-45b^5$

8.) $(x^2y-2xy^2+4y^3)6x^2+(3x^3+2x^2y-xy^2)3xy =$
$= 6x^4y-12x^3y^2+24x^2y^3+9x^4y+6x^3y^2-3x^2y^3 =$
$= 15x^4y-6x^3y^2+21x^2y^3$

9.) $5y(6y^3-4y^2-8y+1)-6y^2(5y^2-4y+6) =$
$= 30y^4-20y^3-40y^2+5y-30y^4+24y^3-36y^2 =$
$= 4y^3-76y^2+5y$

10.) $3ab(1-5b+b^2)-bx(2ab-3b) =$
$= 3ab-15ab^2+3ab^3-2ab^2x+3b^2x$

11.) $[(4x^2-5xy-y^2)3xy-(15x^3y-7x^2y^2+2xy^3)](-3xy^3) =$
$= [12x^3y-15x^2y^2-3xy^3-15x^3y+7x^2y^2-2xy^3](-3xy^3) =$
$= [-3x^3y-8x^2y^2-5xy^3](-3xy^3) =$
$= 9x^4y^4+24x^3y^5+15x^2y^6$

12.) $(6a+7b+8c)(3x+4y) =$
$= 18ax+21bx+24cx+24ay+28by+32cy$

13.) $(a^3-5a^2+6)(4a-7)$

$4a^4-20a^3+24a$
$\quad -7a^3+35a^2-42$

$4a^4-27a^3+35a^2+24a-42$

14.) $(9x^2-24x+16)(3x-4)$

$27x^3-72x^2+48x$
$\quad -36x^2+96x-64$

$27x^3-108x^2+144x-64$

15.) $(x^7+x^5+x^3+x)(x^2-1)$

$x^9+x^7+x^5+x^3$
$\quad -x^7-x^5-x^3-x$

$x^9 \qquad -x$

16.) $(x^4+x^3+x^2+x+1)(x-1)$

$x^5+x^4+x^3+x^2+x$
$\quad -x^4-x^3-x^2-x-1$

$x^5 \qquad -1$

17.) $(a^4+a^3b+a^2b^2+ab^3+b^4)(a-b)$

$a^5+a^4b+a^3b^2+a^2b^2+ab^4$
$\quad -a^4b-a^3b^2-a^2b^2-ab^4-b^5$

$a^5 \qquad -b^5$

18.) $(x-y-z)(x+y-z)$

$x^2-xy-xz$
$\quad +xy \quad -y^2-yz$
$\quad\quad -xz \quad +yz+z^2$

$x^2 \quad -2xz-y^2 \quad +z^2$

19.) $(4x+7y-5)(3x-5y-6)$

$12x^2+21xy-15x$
$\quad -20xy \quad -35y^2+25y$
$\quad\quad -24x \quad -42y+30$

$12x^2+xy-39x-35y^2-17y+30$

20.) $(1-2x+3x^2)(3-2x+4x^2)$

$3-6x+9x^2$
$\quad -2x+4x^2-6x^3$
$\quad\quad +4x^2-8x^3+12x^4$

$3-8x+17x^2-14x^3+12x^4$

21.) $(3x^2-4x-5)(2x^2-3x+4)$

$6x^4-8x^3-10x^2$

$-9x^3+12x^2+15x$

$+12x^2-16x-20$

$6x^4-17x^3+14x^2-x-20$

22.) $(6x^3+5x^2y-5xy^2-y^3)(3x^2-xy+3y^2)$

$18x^5+15x^4y-15x^3y^2-3x^2y^3$

$-6x^4y-5x^3y^2+5x^2y^3+xy^4$

$+18x^3y^2+15x^2y^3-15xy^4-3y^5$

$18x^5+9x^4y-2x^3y^2+17x^2y^3-14xy^4-3y^5$

23.) $(x+3)(x-4)(x-5)=(x^2-x-12)(x-5)=$

$=x^3-6x^2-7x+60$

$(x+3)(x-4)$

x^2+3x

$-4x-12$

x^2-x-12

$(x^2-x-12)(x-5)$

x^3-x^2-12x

$-5x^2+5x+60$

$x^3-6x^2-7x+60$

24.) $(x-3)(x+3)(x^2+9)=(x^2-9)(x^2+9)=x^4-81$

U knjizi fali prednja zagrada.

25.) $x^4-(x+8)(x-8)(x^2+64)=$

$=x^4-(x^2-64)(x^2+64)=x^4-(x^4-64^2)=$

$=x^4-x^4+4096=4096$

---

§ 57. Dijeljenje monoma.

1.) $3a:3=a$ 2.) $5a:a=5$ 3.) $6x:3=2x$

4.) $15ab:5a=3b$ 5.) $24mx:4x=6m$

6.) $36mn:9m=4n$ 7.) $3abc:ac=3b$

8.) $4ax:2ax=2$ 9.) $abx:3ay=\frac{bx}{3y}$

10.) $8x^2y:2x^2=4y$ 11.) $21a^5:3a^2=7a^3$

12.) $6a^4:2a^2=3a^2$ 13.) $9x^4y^3:3x^3y=3xy^2$

14.) $7a^2m^5:4a^2m=\frac{7}{4}m^4$

15.) $18(x+y)^3:9(x+y)=2(x+y)^2$

16.) $(a-5b)^8:(a-5b)^5=(a-5b)^3$

17.) $(a+b)^2:(a+b)=a+b$

18.) $(a-b)^2:(a-b)=a-b$

19.) $(a^2-b^2):(a+b)=a-b$ Vidi § 55

20.) $(a^2-b^2):(a-b)=a+b$ Vježbe II. zad. 21.

1.) $(+28):(-4)=-7$ 2.) $(-32):(-8)=4$

3.) $(-18):9=2$ 4.) $(-4)(+8):(-16)=(-32):(-16)=2$

5.) $(-4)(-8):(-16)=(+32):(-16)=-2$

6.) $(-6am):2m=-3a$

7.) $(-28xy):(-7x)=4y$

8.) $24xy:(-6x)=-4y$

9.) $-64ab^4m:8ab^2=-8b^2m$

10.) $7axy:-5amy=-\frac{7}{5}\frac{x}{m}$

11.) $3a^4b:-bxy=-\frac{3a^4}{xy}$

12.) $-xy:5ax=-\frac{y}{5a}$

13.) $[27a^7b^4x^6:(-3a^3x^2)]:3a^4b^2x^2=$

$=[-9a^4b^4x^4]:3a^4b^2x^2=-3b^2x^2$

---

§ 58. Dijeljenje polinoma.

I.

1.) $(16+40):8=2+5=7$

2.) $(21-12):3=7-4=3$

3.) $(42+30-48):6=7+5-8=4$

4.) $(ax-bx):x = a-b$

5.) $(a^2+a):a = a+1$

6.) $(x^2-x):x = x-1$

7.) $(ax+bx):(-x) = -a-b$

8.) $(-4x+8y):(-4) = x-2y$

9.) $(4a^2+6ab):2a = 2a+3b$

10.) $(9a^2bc-6b^2c^2):3bc = 3a^2-2bc$

11.) $(35x^2y^4-21x^4y^2):(-7x^2y^2) = -5y^2+3x^2$

12.) $[(30a^2bx^2y-20ab^2xy^2):(-5ab)]:(-2xy) =$
$= [-6ax^2y+4bxy^2]:(-2xy) = 3ax-2by$

13.) $(5\frac{1}{2}m^3n^3-6\frac{3}{5}m^4n^2):11m^3n^3 =$
$= (\frac{11}{2}m^3n^3-\frac{33}{5}m^4n^2):11m^3n^3 =$
$= \frac{1}{2}-\frac{3m}{5n}$

14.) $[7a^4-21a^3b(x-y)-7a^4b^3]:(-7a^4) =$
$= a^3-3ab(x-y)-b^3$

15.) $[5x^3y(5x-4y)+5xy^3(3x-2y)]:5xy =$
$= x^2(5x-4y)+y^2(3x-2y) = 5x^3-4x^2y+3xy^2-2y^3$

16.) $3ab+2a = a(3b+2)$

17.) $5x^2y-6xz = x(5xy-6z)$

18.) $3a^2b+6ab^2 = 3ab(a+b)$

19.) $12m^5n^2+8m^4n^3+4m^3n^4 =$
$= 4m^3n^2(3m^2+2mn+n^2)$

20.) $(a+b)c+(a+b)d = (a+b)(c+d)$

21.) $5x(3x-4y)-2y(3x-4y) = (3x-4y)(5x-2y)$

22.) $3x(2x^2+5y^2)-4y(2x^2+5y^2) = (2x^2+5y^2)(3x-4y)$

23.) $5a^3x^2-2a^2x^4+5ab^2y^2-2b^2x^2y^2 =$
$= a^2x^2(5a-2x^2)+b^2y^2(5a-2x^2) =$
$= (5a-2x^2)(a^2x^2+b^2y^2)$

24.) $6a^3xy+6a^3mn-6b^3xy-6b^3mn =$
$6a^3(xy+mn)-6b^3(xy+mn) =$
$= (xy+mn)(6a^3-6b^3) = 6(xy+mn)(a^3-b^3)$

25.) $24x^4y^3-15mnx^2y^2-16mnx^2y+10m^2n^2 =$
$= 3x^2y^2(8x^2y-5mn)-2mn(8x^2y-5mn) =$
$= (8x^2y-5mn)(3x^2y^2-2mn)$

Dijeljenje polinoma.

I.

1.) $(15a+5b):(3a+b) = 5$

$-15a\mp 5b$

0

Primjedba: mnogi od onih zadataka mnogu se pojednostaviti, da se najprije izvodi zajednički faktor u djeljenika, a onda istom izvede dijeljenje. N.p. ad 1.) $5(3a+b)$ 2.) $a(a+2b)$ i t.d.

2.) $(a^2+2ab):(a+2b) = a$

$-a^2\mp 2ab$

0

3.) $(ax^2-ay^2):(x^2-y^2) = a$

$-ax^2+ay^2$

0

4.) $(ac+bc+ad+bd):(a+b) = c+d$

$-ac\mp bc$

$0 \quad +ad+bd$

$\mp ad\mp bd$

0

5.) $(mr+ms+nr+ns):(m+n) = r+s$

$-mr\quad\mp nr$

$+ms+ns$

$\mp ms\mp ns$

0

6.) $(ax-by+ay-bx):(x+y) = a-b$

$-ax\quad\mp ay$

$-by-bx$

$-by-bx$

$+\quad +$

0

7.) $(6mx-9nx+4my-6ny):(2m-3n)=3x+2$

$6mx-9nx$

$+4my-6ny$

$+4my-6ny$

0

8.) $(4a^2+16ab+16b^2):(2a+4b)=2a+4b$

$4a^2+8ab$

$+8ab+16b^2$

$+8ab+16b^2$

0

9.) $(35x^2-27xy-18y^2):(5x-6y)=7x+3y$

$35x^2-42xy$

$+15xy-18y^2$

$+15xy-18y^2$

0

10.) $(10x^3+17x^2+23x+4):(5x+1)=2x^2+3x+4$

$10x^3+2x^2$

$+15x^2+23x$

$+15x^2+3x$

$+20x+4$

$+20x+4$

0

11.) $(x^4+10x^3+35x^2+50x+24):(x+4)=x^3+6x^2+11x+6$

x^4+4x^3

$+6x^3+35x^2$

$+6x^3+24x^2$

$+11x^2+50x$

$+11x^2+44x$

$+6x+24$

$+6x+24$

0

12.) $(4a^3+4a^2-29a+21):(2a-3)=2a^2+5a-7$

$4a^3-6a^2$

$+10a^2-29a$

$+10a^2-15a$

$-14a+21$

$-14a+21$

0

13.) $(42a^4-23a^2x^2-5x^4):(7a^2-5x^2)=6a^2+x^2$

$42a^4-30a^2x^2$

$+7a^2x^2-5x^4$

$+7a^2x^2-5x^4$

0

14.) $(36x^2y^2+37xy-10):(4xy+5)=9xy-2$

$36x^2y^2+45xy$

$-8xy-10$

$-8xy-10$

0

15.) $(104x^4+88ax^2-19):(13x^2-2a)=8x^2+8a$

$104x^4-16ax^2$

$+104ax^2-19$

$+104ax^2-16a^2$

$+16a^2-19$ Ostatak

16.) $(3-11m+16m^2-19m^3+14m^4):(1-2m)=3-5m+6m^2-7m^3$

$3-6m$

$-5m+16m^2$

$-5m+10m^2$

$+6m^2-19m^3$

$+6m^2-12m^3$

$-7m^3+14m^4$

$-7m^3+14m^4$

0

17.) $(4-3a+6a^2+6a^3-3a^4+4a^5):(1+a)=4-7a+13a^2-7a^3+4a^4$

$+4+4a$

$-7a+6a^2$

$-7a-7a^2$

$+13a^3+6a^3$

$+13a^3+13a^3$

$-7a^3-3a^4$

$-7a^3-7a^4$

$+4a^4+4a^5$

$+4a^4+4a^5$

0

18.) $(9x^2-49):(3x+7)=3x-7$. Razlika kvadrata.

19.) $(15x^3+4x^2y-29xy^2+10y^3):(3x+5y)=5x^2-7xy+2y^2$

$+15x^3+25x^2y$

$-21x^2y-29xy^2$

$-21x^2y-35xy^2$

$+6xy^2+10y^3$

$+6xy^2+10y^3$

0

20.) $(x^8-1):(x^2+1)=x^6-x^4+x^2-1$

x^8+x^6

$-x^6-1$

$-x^6-x^4$

$+x^4-1$

$+x^4+x^2$

$-x^2-1$

$-x^2-1$

0

21.) $(y^5-1):(y-1)=y^4+y^3+y^2+y+1$

$-y^5+y^4$

$+y^4-1$

$+y^4-y^3$

$+y^3-1$

$+y^3-y^2$

$+y^2-1$

$+y^2-y$

$+y-1$

$+y-1$

0

22.) $(x^6+y^6):(x-y)=x^5+x^4y+x^3y^2+x^2y^3+xy^4+y^5$

x^6-x^5y

$+x^5y+y^6$

$+x^5y-x^4y^2$

$+x^4y^2+y^6$

$+x^4y^2-x^3y^3$

$+x^3y^3+y^6$

$+x^3y^3-x^2y^4$

$+x^2y^4+y^6$

$+x^2y^4-xy^5$

$+xy^5+y^6$

$+xy^5-y^6$

$+2y^6$ Ostatak.

23.) $(48x^2-12y^2-118x+5y+72):(8x-4y-9)=6x+3y-8$

$48x^2-24xy-54x$

$+24xy-64x-12y^2+5y$

$+24xy\quad -12y^2-27y$

$-64x+32y+72$

$-64x+32y+72$

0

24.) $(15+8x-32x^2+32x^3-15x^4):(3+4x-5x^2)=5-4x+3x^2$

$+15+20x-25x^2$

$-12x-7x^2+32x^3$

$-12x-16x^2+20x^3$

$+9x^2+12x^3-15x^4$

$+9x^2+12x^3-15x^4$

0

25.) $(3a^4-11a^3+29a^2-27a+30):(3a^2-2a+5)=a^2-3a+6$

$+3a^4-2a^3+5a^2$

$-9a^3+24a^2-27a$

$-9a^3+6a^2-15a$

$+18a^2-12a+30$

$+18a^2-12a+30$

0

26.) $(8m^6+27):(4m^4-6m^2+9)=2m^2+3$

$+8m^6-12m^4+18m^2$

$+12m^4-18m^2+27$

$+12m^4-18m^2+27$

0

27.) $(a^6+6a^2-5a^4-1):(2a^2-a^2+1-a^3)=$

$(a^6-5a^4+6a^2-1):(-a^3-a^2+2a+1)=-a^3+a^2+2a-1$

$+a^6+a^5-2a^4-a^3$

$-a^5-3a^4+a^3+6a^2$

$-a^5-a^4+2a^3+a^2$

$-2a^4-a^3+5a^2-1$

$-2a^4-2a^3+4a^2+2a$

$+a^3+a^2-2a-1$

$+a^3+a^2-2a-1$

0

28.) $(15x^4+8x^3y-41x^2y^2+10xy^3+8y^4):(5x^2+6xy-8y^2)=$

$=3x^2-2xy-y^2$

$+15x^4+18x^3y-24x^2y^2$

$-10x^3y-17x^2y^2+10xy^3$

$-10x^3y-12x^2y^2+16xy^3$

$-5x^2y^2-6xy^3+8y^4$

$-5x^2y^2-6xy^3+8y^4$

0

29.) $3ab:(1-ab)=$

$3ab:(-ab+1)=-3$

$-3ab-3$

$+3$ Ostatak

30.) $1:(1+2x+x^2)=1-2x+3x^2-4x^3$ i.d.

$+1+2x+x^2$

$-2x-x^2$

$-2x-4x^2-2x^3$

$+3x^2+2x^3$

$+3x^2+6x^3+3x^4$

$-4x^3-3x^4$

$-4x^3-8x^4-4x^5$

$+5x^4+4x^5$

31.) $4ab:(1-2a)=$

$4ab:(-2a+1)=-2b-\frac{b}{a}$ i.d.

$+4ab-2b$

$+2b$

$+2b-\frac{b}{a}$

$+\frac{b}{a}$

32.) $(16x^6+7x^4-2x^2-1):(4x^3-3x^2+2x-1)=$

$16x^6-12x^5+8x^4-4x^3 \quad = 4x^3+3x^2+2x+1$

$+12x^5-x^4+4x^3-2x^2$

$+12x^5-9x^4+6x^3-3x^2$

$+8x^4-2x^3+x^2-1$

$+8x^4-6x^3+4x^2-2x$

$+4x^3-3x^2+2x-1$

$+4x^3-3x^2+2x-1$

0

33.) $(1-a^{10}):(1+a-a^5-a^6)=1-a+a^2-a^3+a^4$

$+1+a-a^5-a^6$

$-a+a^5+a^6-a^{10}$

$-a-a^2+a^6+a^7$

$+a^2+a^5-a^7-a^{10}$

$+a^2+a^3-a^7-a^8$

$-a^3+a^5+a^8-a^{10}$

$-a^3-a^4+a^8+a^9$

$+a^4+a^5-a^9-a^{10}$

$+a^4+a^5-a^9-a^{10}$

0

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§ 59. Računanje s razlomcima. Rastvaranje općih brojeva na faktore.

Vježbe I.

1.) $x^2+4xy+3y^2=$
$=x^2+xy+3xy+3y^2=$
$=x(x+y)+3y(x+y)=$
$=(x+y)(x+3y)$

2.) $x^2+6xy+5y^2=$
$=x^2+xy+5xy+5y^2=$
$=x(x+y)+5y(x+y)=$
$=(x+y)(x+5y$

Primjedba za zad 2.) U knjizi je tiskarska pogrješka. Srednji član treba da glasi $6xy$ mjesto $6x$.

3.) $a^2-4ab+3b^2=$
$=a^2-ab-3ab+3b^2=$
$=a(a-b)-3b(a-b)=$
$=(a-b)(a-3b)$

4.) $m^2-8mn+7n^2=$
$=m^2-mn-7mn+7n^2=$
$=m(m-n)-7n(m-n)=$
$=(m-n)(m-7n)$

5.) $x^2+6x+5=$
$=x^2+x+5x+5=$
$=x(x+1)+5(x+1)=$
$=(x+1)(x+5)$

6.) $x^2-6x+5=$
$=x^2-x-5x+5=$
$=x(x-1)-5(x-1)=$
$=(x-1)(x-5)$

7.) $x^2-13x+12=$
$=x^2-x-12x+12=$
$=x(x-1)-12(x-1)=$
$=(x-1)(x-12)$

8.) $x^2+11x+24=$
$=x^2+3x+8x+24=$
$=x(x+3)+8(x+3)=$
$=(x+3)(x+8)$

9.) $(x^2-14x+13=$
$=x^2-x-13x+13=$
$=x(x-1)-13(x-1)=$
$=(x-)(x-13)$

10.) $x^2+7x+10=$
$=x^2+2x+5x+10=$
$=x(x+2)+5(x+2)=$
$=(x+2)(x+5)$

11.) $x^2+11x+10=$
$=x^2+x+10x+10=$
$=x(x+1)+10(x+1)=$
$=(x+1)(x+10)$

12.) $x^2+9x+14=$
$=x^2+2x+7x+14=$
$=x(x+2)+7(x+2)=$
$=(x+2)(x+7)$

13.) $x^2-9x+18=$
$=x^2-3x-6x+18=$
$=x(x-3)-6(x-3)=$
$=(x-3)(x-6)$

14.) $x^2-9x+20=$
$=x^2-4x-5x+20=$
$=x(x-4)-5(x-4)=$
$=(x-4)(x-5)$

15.) $x^2-12x+27=$
$=x^2-3x-9x+27=$
$=x(x-3)-9(x-3)=$
$=(x-3)(x-9)$

16.) $6a^2+5ab+b^2=$
$=6a^2+2ab+3ab+b^2=$
$=2a(3a+b)+b(3a+b)=$
$=(3a+b)(2a+b)$

17.) $20a^2+13ab+2b^2=$
$=20a^2+8ab+5ab+2b^2=$
$=4a(5a+2b)+b(5a+2b)=$
$=(5a+2b)(4a+b)$

18.) $6a^2-17ab+10b^2=$
$=6a^2-12ab-5ab+10b^2=$
$=6a(a-2b)-5b(a-2b)=$
$=(a-2b)(6a-5b)$

19.) $x^2+4x-12=$
$=x^2+6x-2x-12=$
$=x(x+6)-2(x+6)=$
$=(x+6)(x-2)$

20.) $x^2-2x-8=$
$=x^2-4x+2x-8=$
$=x(x-4)+2(x-4)=$
$=(x-4)(x+2)$

21.) $x^2+5x-36=$
$=x^2+9x-4x-36=$
$=x(x+9)-4(x+9)=$
$=(x+9)(x-4)$

22.) $x^2-4x-5=$
$=x^2-5x+x-5=$
$=x(x-5)+(x-5)=$
$=(x-5)(x+1)$

23.) $x^2-6x-16=$
$=x^2-8x+2x-16=$
$=x(x-8)+2(x-8)=$
$=(x-8)(x+2)$

24.) $x^2-3x-28=$
$=x^2-7x+4x-28=$
$=x(x-7)+4(x-7)=$
$=(x-7)(x+4)$

25.) $3a^2-2ab-8b^2=$
$=3a^2-6ab+4ab-8b^2=$
$=3a(a-2b)+4b(a-2b)=$
$=(a-2b)(3a+4b)$

26.) $4a^2-17ab-15b^2=$
$=4a^2-20ab+3ab-15b^2=$
$=4a(a-5b)+3b(a-5b)=$
$=(a-5b)(4a+3b)$

27.) $10a^2+13ab-3b^2=$
$=10a^2+15ab-2ab-3b^2=$
$=5a(2a+3b)-b(2a+3b)=$
$=(2a+3b)(5a-b)$

Vježbe II.

Najveća zajednička mjera.

1.) $4ab^2=2.2.a.b.b$
$6a^2bc=2.3.a.a.b.c$
$21abc=3.7.a.b.c$
} $n.z.m=a.b=ab$

2.) $2x^2y^2=2.x.x.y.y$
$8x^4y^3z^3=2.2.2.x.x.x.x.y.y.y.z.z.z$
$12x^3y^5z^2=2.2.3.x.x.x.y.y.y.y.y.z.z$
} $n.z.m=2.x.x.y=2x^2y$

3.) $49a^2-b^2=(7a+b)(7a-b)$
$14ab+2b^2=2b(7a+b)$
} $n.z.m=7a+b$

4.) $4a^2+4ab=2.2.a(a+b)$
$5ab+5b^2=5.b(a+b)$
$8a^2b+8ab^2=2.2.2.a.b(a+b)$
} $n.z.m=a+b$

5.) $x^2-2xy+y^2=(x-y)(x-y)$
$3x-3y=3(x-y)$
} $n.z.m=x-y$

6.) $x^2-6x+9=(x-3)(x-3)$
$x^2-3x=x(x-3)$
} $n.z.m=x-3$

Vježbe III.

Najmanji zajednički višekratnik.

1.) $15a^3b=3.5.a.a.a.b=$
$54a^2b^4=2.3.3.3.a.a.b.b.b.b$
} $N.z.mn=2.3.3.3.5.a.a.a.b.b.b.b=270a^3b^4$

2.) $7ax^2y^3=7.a.x.x.y.y.y$
$5a^2bxy=5.a.a.b.x.y$
$2a^2b^2xy^2=2.a.a.b.b.x.y.y$
} $N.z.mn=2.5.7.a.a.b.b.x.x.y.y.y=70a^2b^2x^2y^3$

3.) $18mn^5x^3y^2 = 2.3.3.m.n.n.n.n.n.x.x.x.y.y$
$45m^3n^3x^2y^4 = 3.3.5.m.m.m.n.n.x.x.y.y.y.y$
$63m^2n^3x^5y^3 = 3.3.7.m.m.n.n.n.x.x.x.x.x.y.y.y$
N.z. $mn = 2.3.3.5.7.m.m.m.n.n.n.n.n.x.x.x.yyyy =$
$= 630m^3n^5x^3y^4$

4.) $3(a-b) = 3.(a-b)$
$a^2-ab = a(a-b)$
N.z. $mn = 3a(a-b)$

5.) N.z. mn je a^2-b^2, jer je $(a+b)$ u a^2-b^2 $(a-b)$ puta sadržano.

6.) $2ax+4bx = 2x(a+2b)$
$6a^2b+12ab^2 = 2.3.a.b(a+2b)$
N.z. $mn. = 2.3.a.b.x(a+2b) = 6abx(a+2b)$

7.) $4a^2+4ab = 2.2.a(a+b)$
$5ab+5b^2 = 5.b.(a+b)$
$8a^2b+8ab^2 = 2.2.2.a.b(a+b)$
N.z. $mn = 2.2.2.5.a.b(a+b) = 40ab(a+b)$

8.) $a^2+3a-10 = (a+5)(a-2)$
$a^2+8a+15) = (a+5)(a+3)$
N.z. $mn = (a+5)(a+3)(a-2)$

9.) $x^2+3xy+2y^2 = (x+y)(x+2y)$
$6x^2+15xy+9y^2 = 3(x+y)(2x+3y)$
N.z. $mn = 3(x+y)(x+2y)(2x+3y)$

10.) $3x+4y = 3x+4y$
$2x^2-xy-12y^2 = (3x+4y)(2x-3y)$
$3x^2+16xy+16y^2 = (3x+4y)(x+4y)$
N.z. $mn = (3x+4y)(2x-3y)(x+4y)$

Vježbe IV.

Svojstva razlomaka.

1.) $\frac{24ab}{16bc} = \frac{3a}{2c}$ /8b 2.) $\frac{35xy}{14ab} = \frac{5xy}{2ab}$ /7

3.) $\frac{12ay^2}{30by} = \frac{2ay}{5b}$ /6y 4.) $\frac{33m^3n^2}{36m^2n^4} = \frac{11m}{12n^2}$ /3m²n

5.) $\frac{45a^3b^2c}{54ab^2c^3} = \frac{5a^2}{6c^2}$ /9ab²c 6.) $\frac{a^2-b^2}{(a+b)^2} = \frac{a-b}{a+b}$ /(a+b)

7.) $\frac{(x-y)^2}{x^2-y^2} = \frac{x-y}{x+y}$ /(x-y) 8.) $\frac{(m+n)^2}{m^2-n^2} = \frac{m+n}{m-n}$ /(m+n)

9.) $\frac{a^2+ab}{b^2+ab} = \frac{a(a+b)}{b(a+b)} = \frac{a}{b}$

10.) $\frac{a^2-1}{a^3-a} = \frac{a^2-1}{a(a^2-1)} = \frac{1}{a}$

11.) Tiskarska pogrješka.

12.) $\frac{a^2-b^2}{a^2+2ab+b^2} = \frac{(a+b)(a-b)}{(a+b)(a+b)} = \frac{a-b}{a+b}$

13.) $\frac{x^2-1}{x^2-2x-3} = \frac{(x+1)(x-1)}{(x+1)(x-3)} = \frac{x-1}{x-3}$

14.) $\frac{x^2+4x+4}{x^2+5x+6} = \frac{(x+2)(x+2)}{(x+2)(x+3)} = \frac{x+2}{x+3}$

15.) $\frac{x^2-3x-10}{x^2+10x+16} = \frac{(x-5)(x+2)}{(x+2)(x+8)} = \frac{x-5}{x+8}$

U knjizi tiskarska pogrješka. Stoji x^3 mjesto x^2.

16.) $\frac{x^2-8x+15}{x^2-10x+21} = \frac{(x-5)(x-3)}{(x-7)(x-3)} = \frac{x-5}{x-7}$

17.) $\frac{a^2-5ab+6b^2}{3a^2-5ab-12b^2} = \frac{(a-3b)(a-2b)}{(a-3b)(3a+4b)} = \frac{a-2b}{3a+4b}$

18.) $\frac{24x^2-12x}{36x^2-36x+9} = \frac{12x(2x-1)}{9(4x^2-4x+1)} = \frac{12x(2x-1)}{9(2x-1)^2} = \frac{4x}{3(2x-1)}$

19.) $a = \frac{5a}{5} = \frac{3a^2}{3a} = \frac{ax}{x} = \frac{ay^2}{y^2} = \frac{a(x+y)}{x+y}$

$5b = \frac{25b}{5} = \frac{15ab}{3a} = \frac{5bx}{x} = \frac{5by^2}{y^2} = \frac{5b(x+y)}{x+y}$

$2mn = \frac{10mn}{5} = \frac{6amn}{3a} = \frac{2mnx}{x} = \frac{2mny^2}{y^2} = \frac{2mn(x+y)}{x+y}$

$x+y = \frac{5(x+y)}{5} = \frac{3a(x+y)}{3a} = \frac{x(x+y)}{x+y} = \frac{y^2(x+y)}{x+y} = \frac{(x+y)^2}{x+y}$

20.) $\frac{m}{2m} = \frac{6m}{12n} = \frac{3mn}{6n^2} = \frac{12mxy}{24nxy}$

21.) a.) $\frac{a}{2} = \frac{a^2}{2a}$ $\quad \frac{b}{a} = \frac{2b}{2a}$ $\quad$ b.) $\frac{3}{2a} = \frac{15}{10a}$ $\quad \frac{2}{5a} = \frac{4}{10a}$ $\quad$ c.) $\frac{a}{5b} = \frac{3a^2}{15ab}$ $\quad \frac{b}{3a} = \frac{5b^2}{15ab}$

d.) $\frac{5x}{7bc} = \frac{15dx}{21bcd}$ $\quad \frac{2y}{3cd} = \frac{14by}{21bcd}$ $\quad$ e.) $\frac{x}{x+y} = \frac{x(x-y)}{x^2-y^2}$ $\quad \frac{x}{x-y} = \frac{x(x+y)}{x^2-y^2}$

f.) $\frac{x+2}{x^2-5x+6} = \frac{x+2}{(x-2)(x-3)} = \frac{(x+2)(x-1)}{(x-1)(x-2)(x-3)}$

$\frac{x-2}{x^2-4x+3} = \frac{x-2}{(x-1)(x-3)} = \frac{(x-2)^2}{(x-1)(x-2)(x-3)}$

g.) $\frac{x-1}{x+1} = \frac{(x-1)^2}{x^2-1}$ $\quad \frac{x+1}{x-1} = \frac{(x+1)^2}{x^2-1}$

h.) U knjizi fali drugi razlomak

i.) $\frac{n}{2a-2b} = \frac{2n(a+b)}{4(a^2-b^2)}$

$\frac{p}{4(a^2-b^2)} = \frac{p}{4(a^2-b^2)}$

k.) $\frac{x+5}{x^2+x-2} = \frac{x+5}{(x-1)(x+2)} = \frac{(x+5)(x-2)}{(x-1)(x+2)(x-2)}$

$\frac{x+4}{x^2-4} = \frac{x+4}{(x-2)(x+2)} = \frac{(x+4)(x-1)}{(x-1)(x+2)(x-2)}$

$\frac{x+2}{x^3-x^2-4x+4} = \frac{x+2}{(x^2-4)(x-1)} = \frac{x+2}{(x-1)(x+2)(x-2)}$

l.) $\frac{3a-b}{3z^2} = \frac{4(z^2-y^2)(3a-b)}{12z^2(z^2-y^2)}$

$\frac{a}{2z} = \frac{6z(z^2-y^2)\cdot a}{12z^2(z^2-y^2)}$

$\frac{5}{4(z^2-y^2)} = \frac{15z^2}{12z^2(z^2-y^2)}$

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§ 60. Zbrajanje i oduzimanje razlomaka.

1.) $\frac{3}{a} + \frac{4}{a} = \frac{7}{a}$ $\quad$ 2.) $\frac{a}{m} + \frac{b}{m} + \frac{5}{m} = \frac{a+b+5}{m}$

3.) $\frac{a}{x} + \frac{m+n}{x} = \frac{a+m+n}{x}$

4.) $\frac{a}{c} - \frac{1}{c} = \frac{a-1}{c}$

5.) $\frac{8a}{3x} - \frac{2a}{3x} + \frac{1}{3x} = \frac{8a-2a+1}{3x} = \frac{6a+1}{3x}$

6.) $\frac{5a}{xy} - \frac{8b-7a}{xy} = \frac{5a-8b+7a}{xy} = \frac{12a-8b}{xy}$

7.) $\frac{5x}{x-1} - \frac{1+2x}{x-1} = \frac{5x-1-2x}{x-1} = \frac{3x-1}{x-1}$

8.) $\frac{2m+2n}{4} - \frac{2m-3n}{4} = \frac{2m+2n-2m+3n}{4} = \frac{5n}{4}$

9.) $\frac{8x-9x}{3m} + \frac{2(2x+3y)}{3m} + \frac{3(3x-2y)}{3m} =$

$= \frac{8x-9x+4x+6y+9x-6y}{3m} = \frac{12x}{3m} = \frac{4x}{m}$

10.) $\frac{m-a}{m+n+p} + \frac{n-p}{m+n+p} + \frac{2p+a}{m+n+p} =$

$= \frac{m-a+n-p+2p+a}{m+n+p} = \frac{m+n+p}{m+n+p} = 1$

1.) $\frac{2a+b}{3} + \frac{5a+2b}{4} = \frac{4(2a+b)+3(5a+2b)}{12} =$

$= \frac{8a+4b+15a+6b}{12} = \frac{23a+10b}{12}$

2.) $\frac{x}{2m} + \frac{2x}{3m} + \frac{7x}{8m} = \frac{12x+16x+21x}{24m} = \frac{49x}{24m}$

3.) $\frac{a+b}{7} - \frac{a-b}{8} = \frac{8(a+b)-7(a-b)}{56} =$

$= \frac{8a+8b-7a+7b}{56} = \frac{a+15b}{56}$

4.) $\frac{m+n}{26} + \frac{m-n}{39} = \frac{3(m+n)+2(m-n)}{78} =$

$= \frac{3m+3n+2m-2n}{78} = \frac{5m+n}{78}$

5.) $\frac{x+y}{26m} - \frac{x-y}{39n} = \frac{3n(x+y)-2m(x-y)}{78mn} =$

$= \frac{3nx+3ny-2mx+2my}{78mn}$

6.) $\frac{1}{a} + \frac{2}{a-2} = \frac{a-2+2a}{a(a-2)} = \frac{3a-2}{a(a-2)}$

7.) $\frac{3}{x-3} - \frac{5}{x} = \frac{3x-5(x-3)}{x(x-3)} = \frac{3x-5x+15}{x(x-3)} = \frac{-2x+15}{x(x-3)}$

8.) $\frac{x}{x+2} + \frac{x}{x-2} = \frac{x(x-2)+x(x+2)}{x^2-4} = \frac{x^2-2x+x^2+2x}{x^2-4} = \frac{2x^2}{x^2-4}$

9.) $\frac{1}{a-b}+\frac{1}{a+b}=\frac{a+b+a-b}{a^2-b^2}=\frac{2a}{a^2-b^2}$

10.) $\frac{1}{m+n}+\frac{2n}{m^2-n^2}=\frac{m-n+2n}{m^2-n^2}=\frac{m+n}{m^2-n^2}=\frac{1}{m-n}$

11.) $\frac{y}{2y-2x}-\frac{x}{2x-2y}=\frac{y}{2y-2x}+\frac{x}{2y-2x}=\frac{x+y}{2y-2x}$

Primjedba: $2x-2y=-(2y-2x)$. Zadatak se zato može ovako napisati: $\frac{y}{2y-2x}-\left(-\frac{x}{2y-x}\right)$

12.) $\frac{2}{a}-\frac{3}{2a^2}+\frac{5}{a^3}+\frac{7}{4a^4}=\frac{8a^3-6a^2+20a+7}{4a^4}$

13.) $\frac{12x+4}{x^2-4}-\frac{2x+1}{x-2}=\frac{12x-4-(2x+1)(x+2)}{x^2-4}=$

$=\frac{12x-4-(2x^2+5x+2)}{x^2-4}=\frac{12x-4-2x^2-5x-2}{x^2-4}=\frac{7x-2x^2-6}{x^2-4}$

14.) $\frac{1}{x-y}+\frac{1}{x+y}-\frac{1}{x^2-y^2}=\frac{x+y+x-y-1}{x^2-y^2}=\frac{2x-1}{x^2-y^2}$

15.) $\frac{1}{x-1}+\frac{2}{(x-1)^2}+\frac{3}{(x-1)^3}=\frac{(x-1)^2+2(x-1)+3}{(x-1)^3}=$

$=\frac{x^2-2x+1+2x-2+3}{(x-1)^3}=\frac{x^2+2}{(x-1)^3}$

16.) $\frac{4}{x+1}\ \frac{3}{x-1}+\frac{1}{x+2}-\frac{2}{x-2}=$

$=\frac{4(x-1)(x^2-4)-3(x+1)(x^2-4)+(x-2)(x^2-1)-2(x+2)(x^2-1)}{(x^2-1)(x^2-4)}=$

$=\frac{(x^2-4)(4x-4-3x-3)+(x^2-1)(x-2-2x-4)}{(x^2-1)(x^2-4)}$

$=\frac{(x^2-4)(x-7)+(x^2-1)(-x-6)}{(x^2-1)(x^2-4)}=\frac{x^3-4x-7x^2+28-x^3-6x^2+6}{(x^2-1)(x^2-4)}=$

$=\frac{-13x^2-3x+34}{(x^2-1)(x^2-4)}$

U knjizi je valjda pogrješka u prvom razlomku u predznaku drugog člana u nazivniku

17.) $3+\frac{a}{b}=\frac{3b+a}{b}$

2.) $m-\frac{m}{n}=\frac{mn-m}{n}=\frac{m(n-1)}{n}$

3.) $\frac{3x}{5y}-1=\frac{3x-5y}{5y}$

4.) $\frac{3mn}{8}+m=\frac{3mn+8m}{8}=\frac{m(3n+8)}{8}$

5.) $a-\frac{a+b}{2}=\frac{2a-a-b}{2}=\frac{a-b}{2}$

6.) $a-\frac{a-b}{2}=\frac{2a-a+b}{2}=\frac{a+b}{2}$

7.) $\frac{(x-y)^2}{4x}+y=\frac{x^2-2xy+y^2+4xy}{4x}=\frac{x^2+2xy+y^2}{4x}=$

$=\frac{(x+y)^2}{4x}$

8.) $\frac{(x+y)^2}{4xy}-1=\frac{x^2+2xy+y^2-4xy}{4xy}=\frac{x^2-2xy+y^2}{4xy}=$

$=\frac{(x-y)^2}{4xy}$

9.) $m+1+\frac{1}{m+1}=\frac{(m+1)^2+1}{m+1}=\frac{m^2+2m+2}{m+1}$

10.) $(a+b)-\frac{2ab}{a+b}=\frac{(a+b)^2-2ab}{a+b}=\frac{a^2+2ab+b^2-2ab}{a+b}=$

$=\frac{a^2+b^2}{a+b}$.

11.) $\frac{x^2+y^2}{x-y}-(x+y)=\frac{x^2+y^2-(x^2-y^2)}{x-y}=\frac{x^2+y^2-x^2+y^2}{x-y}=$

$=\frac{2y^2}{x-y}$

12.) $1-\frac{a^2-b^2-c^2}{2bc}=\frac{2bc-a^2+b^2+c^2}{2bc}=\frac{(b+c)^2-a^2}{2bc}$

§. 61. Množenje razlomaka.

1.) $\frac{m}{3}\cdot 5=\frac{5m}{3}$ 2.) $\frac{2m}{3n}\cdot m=\frac{2m^2}{3n}$

3.) $\frac{x}{m}\cdot m=\frac{x}{1}=x$ 4.) $\frac{5a}{6b}\cdot 3b=\frac{5a}{2}$

5.) $\frac{7x}{9y}\cdot 3xy=\frac{7xz}{3}$ 6.) $\left(-\frac{3a}{c}\right)4ab=-12a^2$

7.) $\frac{5x}{8y}\cdot 4x^2y=\frac{5x^3}{2}$ 8.) $\frac{5a}{8b}\cdot 6a^2y=\frac{15a^3y}{4b}$

9.) $\frac{a-b}{mn}\cdot m=\frac{a-b}{n}$ 10.) $\frac{x+y}{ab}\cdot a^2b=a(x+y)$

11.) $\frac{m+n}{x^2y}\cdot x^2y^3=y^2(m+n)$

12.) $\frac{4x+3y}{30x^3}\cdot 10x^2 = \frac{4x+3y}{3x}$

13.) $-\frac{3ab}{4ca}\cdot(-8ac) = \frac{6a^2b}{a}$ 14.) $\frac{2}{1-m^2}\cdot(1+m) = \frac{2}{1-m}$

15.) $\left(2+\frac{3}{7a}\right)7a = 14a+3$

16.) $\left(\frac{3}{5m}-1\right)5m = 3-5m$

17.) $\left(\frac{x^2}{y^2}-\frac{2x}{y}+3\right)y^2 = x^2-2xy+3y^2$

18.) $\left(\frac{a^2}{b^2}-\frac{2a}{a}+1\right)ab = \frac{a^3}{a}-2a^2+ab$

19.) $\left(x-y+\frac{x^2+y^2}{x+y}\right)(x+y) = x^2-y^2+x^2+y^2 = 2x^2$

20.) $\left(\frac{3x}{4}-\frac{5}{6y}-\frac{3z}{x}\right)3xy = \frac{9x^2y}{4}-\frac{5x}{2}-24zy$

21.) $\frac{3xy+x^2}{x+y}(x^2-y^2) = (3xy+x^2)(x-y) =$

$= 3x^2y+x^3-3xy^2-x^2y = 2x^2y+x^3-3xy^2$

22.) $\frac{3(a+b)}{a-b}(a^2-b^2) = 3(a+b)^2$

23.) $\frac{3a^2}{8(x+2y)}\cdot 6(x+2y) = \frac{9a^2}{4}$

24.) $\frac{x-3}{x^2-2x+1}(3x-3) = \frac{x-3}{(x-1)^2}3(x-1) = \frac{3(x-3)}{x-1}$

1.) $3a\cdot\frac{7b}{6a} = \frac{7b}{2}$

2.) $3xy\,\frac{5x}{6y} = \frac{5x^2}{2}$ 3.) $2m\,\frac{ab}{c} = \frac{2abm}{c}$

4.) $8x^2\,\frac{15a}{12xy} = \frac{10ax}{3y}$

5.) $2(x+y)\frac{x-y}{x+y} = 2(x-y)$

6.) $5(a-b)\frac{a^2+b^2}{a^2-b^2} = \frac{5(a^2+b^2)}{a+b}$

7.) $3(x^2-y^2)\left(\frac{9x}{x-y}-\frac{3y}{x+y}\right) = 27x(x+y)-9y(x-y) =$

$= 27x^2+27xy-9xy+9y^2 = 27x^2-18xy+9y^2$

1.) $\frac{4a}{5b}\cdot\frac{3x}{5y} = \frac{12ax}{25by}$ 2.) $\frac{3m}{2n}\cdot\frac{3a}{3b} = \frac{9am}{6bn} = \frac{3am}{2bn}$

3.) $\frac{6x^3y}{m^3}\cdot\frac{9x^2y^3}{4m^2} = \frac{27x^5y^4}{2m^5}$

4.) $\left(-\frac{5x^3}{3y^3}\right)\frac{2y^2}{3x^2} = -\frac{10x}{9y}$

5.) $\frac{a}{a+b}\cdot\frac{x+y}{x} = \frac{a(x+y)}{x(a+b)}$

6.) $\frac{x-1}{x+1}\cdot\frac{x^2-1}{x} = \frac{(x-1)^2}{x}$

7.) $\frac{m+n}{m-n}\cdot\frac{m^2-n^2}{3} = \frac{(m+n)^2}{3}$

8.) $\frac{x^2-y^2}{y-x}\cdot\frac{x}{x+y} = \frac{(x^2-y^2)x}{[-(x-y)](x+y)} = \frac{(x^2-y^2)x}{-(x^2-y^2)} = -x$

9.) $\left(a+\frac{b}{x}\right)\left(a-\frac{b}{x}\right) = a^2-\frac{b^2}{x^2}$

10.) $\left(\frac{m}{n}+\frac{x}{y}\right)\left(\frac{m}{n}-\frac{x}{y}\right) = \frac{m^2}{n^2}-\frac{x^2}{y^2}$

11.) $\left(\frac{a+b}{a-b}+1\right)\left(\frac{a-b}{a+b}-1\right) = \frac{a+b+a-b}{a-b}\cdot\frac{a-b-a-b}{a+b} =$

$= \frac{2a}{a-b}\cdot\frac{-2b}{a+b} = -\frac{4ab}{a^2-b^2}$

12.) $\left(\frac{x}{2}+\frac{x}{3}-\frac{x}{4}\right)\left(\frac{5}{x}-\frac{6}{x}\right) = \frac{5}{2}+\frac{5}{3}-\frac{5}{4}-\frac{6}{2}-\frac{6}{3}+\frac{6}{4} =$

$= -\frac{1}{2}-\frac{1}{3}+\frac{1}{4} = -\frac{7}{12}$

13.) $\left(\frac{x^2-1}{x^2}-\frac{x-1}{x}+1\right)\left(\frac{x+1}{x}-2\right) =$

$= \frac{x^2-1-x^2+x+x}{x^2}\cdot\frac{x+1-2x}{x} = \frac{x^2+x-1}{x^2}\cdot\frac{1-x}{x} =$

$= \frac{-x^3+2x-1}{x^3}$

14.) $\left(\frac{1}{a+b}-\frac{2}{a-b}+\frac{3}{a^2-b^2}\right)\frac{(a+b)^2}{mn} =$

$= \frac{a-b-2(a+b)+3}{a^2-b^2}\cdot\frac{(a+b)^2}{mn} = \frac{a-b-2a-2b+3}{a-b}\cdot\frac{a+b}{mn} =$

$= \frac{(-a-3b+3)(a+b)}{mn(a-b)}$

15.) $\frac{a^2x}{by}\cdot\frac{mx^2}{ny}\cdot 5a^2b^3 = \frac{5a^4b^3mx^3}{bny^2} = \frac{5a^4b^2mx^3}{ny^2}$

16.) $\frac{x^2-1}{2x+3}\cdot\frac{2x+3}{x+1}\cdot\frac{3}{x-1} = \frac{(2x+3)(x-1)(x+1)\cdot 3}{(2x+3)(x-1)(x+1)} = 3$

17.) $\left(1+\frac{a}{b}\right)\left(1-\frac{a}{b}\right)\frac{a}{a+b}\cdot\frac{b}{-a+b} = \left(1-\frac{a^2}{b^2}\right)\frac{a}{a+b}\left(\frac{-b}{a-b}\right) =$

$= \frac{b^2-a^2}{b^2}\cdot\left(\frac{-ab}{a^2-b^2}\right) = \frac{ab(a^2-b^2)}{b^2(a^2-b^2)} = \frac{a}{b}$

18) $\left(\frac{3m}{m-1}-\frac{2m}{m+1}-\frac{m^2}{m^2-1}\right)\cdot\frac{m^2-1}{m}=$

$=\frac{3m(m+1)-2m(m-1)-m^2}{m^2-1}\cdot\frac{m^2-1}{m}=$

$=\frac{3m^2+3m-2m^2+2m-m^2}{m}=5$

19) $\left(\frac{a}{b}+\frac{a^3}{3b^2}+\frac{a^5}{5b^3}+\frac{a^7}{7b^4}\right)\left(\frac{b^5}{a^5}-\frac{3b^4}{a^4}+\frac{5b^3}{a}\right)=$

$=\frac{b^4}{a^4}+\frac{b^3}{3a^2}+\frac{b^2}{5}+\frac{a^2b}{7}-\frac{3b^3}{a^2}-b^2-\frac{3a^2b}{5}-\frac{3a^4}{7}+$

$+5b^2+\frac{5ba^2}{3}+a^4+\frac{5a^6}{7b}=$

$=\frac{105b^5+35a^2b^4+21a^4b^3+15a^6b^2-315a^2b^4-105a^4b^3-63a^6b^2-45a^8b+525a^4b^3+175a^6b^2+105a^8b+75a^{10}}{105a^4b}=$

$=\frac{105b^5-280a^2b^4+441a^4b^3+127a^6b^2+60a^8b+75a^{10}}{105a^4b}$

20) $\left(\frac{2x^3}{y^2}-\frac{3x^2}{y}+\frac{4x}{5}-5y\right)\left(\frac{x^2}{y}-\frac{2x}{3}+4y\right)=$

$=\frac{10x^3-15x^2y+4xy^2-25y^3}{5y^2}\cdot\frac{3x^2-2xy+12y^2}{3y}=$

$=\frac{30x^5-45x^4y+12x^3y^2-75x^2y^3-20x^4y+30x^3y^2-8x^2y^3+50xy^4+120x^3y^2-180x^2y^3+48xy^4-300y^5}{15y^3}=$

$=\frac{30x^5-65x^4y+162x^3y^2-263x^2y^3+98xy^4-300y^5}{15y^3}$

---

§ 62. Dijeljenje razlomaka.

1) $\frac{a^2}{b}:a=\frac{a}{b}$ 2) $\frac{xy}{m}:y=\frac{x}{m}$ 3) $\frac{4a}{5m}:2a=\frac{2}{5m}$

4) $\frac{ax}{5y}:3y=\frac{2x}{5y^2}$ 5) $\frac{a}{b}:b=\frac{a}{b^2}$

6) $\frac{a^2}{b^2}:ab=\frac{a}{b^3}$ 7) $\frac{7m^2}{2n^2}:3mn=\frac{7m}{6n^3}$

8) $\frac{5mx}{6ny}:(-3nx)=-\frac{5m}{18n^2y}$

9) $\frac{27(x^2-y)}{4xy}:9(x+y)=\frac{3(x-y)}{4xy}$

10) $(a+\frac{b}{c}):m=\frac{ac+b}{c}:m=\frac{ac+b}{mc}$

11) $\left(\frac{a}{b}-\frac{b}{y}\right):2xy=\frac{ay-b^2}{by}:2xy=\frac{ay-b^2}{2bxy^2}$

12) $\left(x-\frac{x^2}{x-1}\right):(x+1)=\frac{x^2-x-x^2}{x-1}:(x+1)=\frac{-x}{x^2-1}=\frac{x^2}{1-x^2}$

13) $\left(a+\frac{ab}{a-b}\right):4a^2=\frac{a^2-ab+ab}{a-b}:4a^2=\frac{a^2}{a-b}:4a^2=\frac{1}{4(a-b)}$

14) $\left(1+\frac{x}{y}\right):2(x+y)=\frac{y+x}{y}:2(x+y)=\frac{1}{2y}$

15) $\left(a-\frac{a^2}{a-1}\right):(a+1)=\frac{a^2-a-a^2}{a-1}:(a+1)=\frac{-a}{a^2-1}=\frac{a}{1-a^2}$

16) $\left(2-\frac{y}{x+2y}\right):(2x+3y)=\frac{2x+4y-y}{x+2y}:(2x+3y)=$

$=\frac{2x+3y}{x+2y}:(2x+3y)=\frac{1}{x+2y}$

17) $\left(\frac{x^3}{y^2}-\frac{3x^2}{y}+5x-7y+\frac{4y^2}{x}\right):(x-y)=$

$=\frac{x^4-3x^3y+5x^2y^2-7xy^3+4y^4}{xy^2(x-y)}$

II.

1) $x:\frac{1}{y}=x\cdot\frac{y}{1}=xy$ 2) $m:\frac{1}{m}=m^2$

3) $7b^2:\frac{7ab}{3c}=\frac{21b^2c}{7ab}=\frac{3bc}{a}$

4) $9a^3b^2y:\left(-\frac{6ab^2}{5xy}\right)=3a^2y:\left(-\frac{2}{5xy}\right)=-\frac{15a^2xy^2}{2}$

5) $(a+x):\frac{a+x}{y}=1:\frac{1}{y}=y$

6) $(a-x):\frac{y}{a-x}=\frac{(a-x)^2}{y}$

7) $(x^2-y^2):\frac{x-y}{x+y}=(x+y):\frac{1}{x+y}=(x+y)^2$

8) $(x^2-y^2):\frac{x+y}{x-y}=(x-y):\frac{1}{x-y}=(x-y)^2$

12.) $2a^2x^2 : \left(\frac{m}{x^2} - \frac{n}{a^3}\right) = 2a^2x^2 : \frac{a^3m - x^2n}{a^3x^2} =$

$= \frac{2a^5x^4}{a^3m - x^2n}$

13.) $27 : \left(3 + \frac{6x+6}{x^2-2x-3}\right) = 27 : \left(\frac{3x^2-6x-9+6x+6}{x^2-2x-3}\right) =$

$= 27 : \frac{3(x^2-1)}{x^2-2x-3} = 9 : \frac{x^2-1}{x^2-2x-3} = 9 : \frac{(x-1)(x+1)}{(x-3)(x+1)} =$

$= 9 : \frac{x-1}{x-3} = \frac{9(x-3)}{x-1}$

III. IV.

1.) $\frac{5a}{6b} : \frac{2b}{5a} = \frac{5a}{6b} \cdot \frac{5a}{2b} = \frac{25a^2}{12b^2}$

2.) $\frac{16x}{15y} : \frac{2x}{5y} = \frac{16x : 2x}{15y : 5y} = \frac{8}{3}$

3.) $-\frac{5ab^2}{y^2} : \frac{b}{y} = -\frac{5ab}{y}$

4.) $-\frac{3}{8x^2y^2} : -\frac{5}{4xy} = -\frac{3}{2xy} : -5 = \frac{3}{10xy}$

5.) $\frac{19ab^2}{16xy^2} : \frac{14ab}{9xy} = \frac{19b}{16y} : \frac{14}{9} = \frac{171b}{224y}$

6.) $\frac{x^2-y^2}{a^2-b^2} : \frac{a+b}{x+y} = \frac{(x-y)(x+y)^2}{(a-b)(a+b)^2}$

7.) $\frac{x^2-y^2}{a^2-b^2} : \frac{x+y}{a+b} = \frac{x-y}{a-b}$

8.) $\left(\frac{m^2}{n^2} - \frac{m}{n}\right) : \frac{m}{n} = \frac{m}{n} - 1 = \frac{m-n}{n}$

9.) $\left(\frac{21x^3}{5y^3} \pm \frac{15x^2}{7y^3}\right) : \frac{3x}{y} = \frac{7x^2}{5y^2} \pm \frac{5x}{7y^2} = \frac{49x^2 \pm 25x}{35y^2}$

10.) $\left(\frac{1}{x+y} \pm \frac{1}{x-y}\right) : \frac{xy}{x^2-y^2} = \frac{x-y}{xy} \pm \frac{x+y}{xy} = \frac{2}{y}$ i $-\frac{2}{x}$

11.) $\left(\frac{5a}{3bc} + \frac{4c}{3ab} - \frac{3b}{2ac}\right) : \frac{6}{abc} =$

$= \frac{10a^2+8c^2-9b^2}{6abc} : \frac{6}{abc} = \frac{10a^2+8c^2-9b^2}{36}$

12.) $\left(\frac{x}{y}+1\right) : \left(\frac{y}{x}-1\right) = \frac{x+y}{y} : \frac{y-x}{x} = \frac{x(x+y)}{y(y-x)}$

13.) $\left(\frac{a}{b} + \frac{x}{y}\right) : \left(\frac{a}{b} - \frac{x}{y}\right) = \frac{ay+bx}{by} : \frac{ay-bx}{by} = \frac{ay+bx}{ay-bx}$

14.) $\left(\frac{a^2}{b^2} - \frac{x^2}{y^2}\right) : \left(\frac{a}{b} - \frac{x}{y}\right) = \frac{a}{b} + \frac{x}{y} = \frac{ay+bx}{by}$

15.) $\left(\frac{x^2}{a^2} - \frac{a}{x^2}\right) : \left(\frac{a}{x^2} + \frac{1}{a}\right) = \frac{x^4-a^3}{a^2x^2} : \frac{a^2+x^2}{ax^2} =$

$= \frac{x^4-a^3}{a(a^2+x^2)}$

16.) $\left(\frac{a^2}{9} + \frac{a}{3} + \frac{1}{4}\right) : \left(\frac{a}{3} + \frac{1}{2}\right) = \frac{a}{3} + \frac{1}{2}$

$\frac{a^2}{9} + \frac{a}{6}$

$- \frac{a^2}{9} - \frac{a}{6}$

$+ \frac{a}{6} + \frac{1}{4}$

$+ \frac{a}{6} + \frac{1}{4}$

$- \quad - \quad$

0

17.) $\left(\frac{x^2}{4} - \frac{x}{5} + \frac{1}{25}\right) : \left(\frac{x}{2} - \frac{1}{5}\right) = \frac{x}{2} - \frac{1}{5}$

$\frac{x^2}{4} - \frac{x}{10}$

$- \frac{x^2}{4} + \frac{x}{10}$

$- \frac{x}{10} + \frac{1}{25}$

$- \frac{x}{10} + \frac{1}{25}$

$+ \quad - \quad$

0

18.) $\left(\frac{a^2}{x^2} + \frac{a}{6x} - \frac{1}{6}\right) : \left(\frac{a}{x} + \frac{1}{2}\right) = \frac{a}{x} - \frac{1}{3}$

$\frac{a^2}{x^2} + \frac{a}{2x}$

$- \frac{a^2}{x^2} - \frac{a}{2x}$

$\left(-\frac{2a}{6x} - \frac{1}{6}\right) = -\frac{a}{3x} - \frac{1}{6}$

$-\frac{a}{3x} - \frac{1}{6}$

$+ \frac{a}{3x} + \frac{1}{6}$

0

19.) $\left(\frac{75x^2}{y^2} + \frac{4y}{5x} + 1\right) : \left(\frac{2x}{y} + \frac{1}{5}\right) = \frac{75x}{2y} - \frac{15}{2} + \frac{4y}{2x}$

$\frac{75x^2}{y^2} + \frac{15x}{y}$

$- \frac{75x^2}{y^2} - \frac{15x}{y}$

$- \frac{15x}{y} + \frac{4y}{5x} + 1$

$- \frac{15x}{y} \quad - 3$

$+ \frac{15x}{y} \quad +$

$+ 4 + \frac{4y}{5x}$

$+ 4 + \frac{4y}{5x}$

$- \quad - \quad$

0

20.) $\left(\frac{6}{x^2}+\frac{16}{xy}-\frac{6}{y^2}\right):\left(\frac{6}{x}-\frac{2}{y}\right)=\frac{1}{x}+\frac{3}{y}$

$\frac{6}{x^2}-\frac{2}{xy}$

$-\quad +$

$+\frac{18}{xy}-\frac{6}{y^2}$

$+18\cdot\quad -\frac{6}{}$

$-xy+y^2$

0

21.) $\left(\frac{x^3}{y^3}+\frac{y^3}{x^3}\right):\left(\frac{x^2}{y^2}-1+\frac{y^2}{x^2}\right)=\frac{x}{y}+\frac{y}{x}$

$\frac{x^3}{y^3}-\frac{x}{y}+\frac{y}{x}$

$-\quad +\quad -$

$+\frac{x}{y}-\frac{y}{x}+\frac{y^3}{x^3}$

$+\frac{x}{y}-\frac{y}{x}+\frac{y^3}{x^3}$

$-\quad +\quad -$

0

22.) $\left(\frac{x^4}{81}+\frac{4x^3}{9}+6x^2+36x+81\right):\left(\frac{x^2}{9}+2x+9\right)=$

$\frac{x^4}{81}+\frac{2x^3}{9}+x^2 \qquad =\frac{x^2}{9}+2x+9$

$-\quad -\quad -$

$+\frac{2x^3}{9}+5x^2+36x$

$-\frac{2x^3}{9}+4x^2+18x$

$-\quad +\quad -$

$+x^2+18x+81$

$+x^2+18x+81$

$-\quad -\quad -$

0

23.) $\frac{a+b}{\frac{a}{b}}=\frac{b(a+b)}{a}$

24.) $\frac{\frac{2a^2}{b}}{\frac{5a}{4b^3}}=\frac{2a^2}{b}\cdot\frac{4b^3}{5a}=\frac{8ab^2}{5}$

25.) $\frac{\frac{a+b}{m}}{\frac{c+d}{n}}=\frac{(a+b)n}{(c+d)m}$

26.) $\frac{1-\frac{a}{x}}{1-\frac{b}{x}}=\frac{\frac{x-a}{x}}{\frac{x-b}{x}}=\frac{x-a}{x-b}$

27.) $\frac{1}{1+\frac{b}{x}}=\frac{1}{\frac{x+b}{x}}=\frac{x}{x+b}$

28.) $\frac{\frac{2m}{5n}}{x+y}=\frac{2m}{5n(x+y)}$

29.) $\frac{\frac{2m}{5n}}{x+y}=\frac{2m(x+y)}{5n}$

30.) $\frac{1}{\frac{a}{b}-\frac{c}{d}}=\frac{1}{\frac{ad-bc}{bd}}=\frac{bd}{ad-bc}$

31.) $\frac{a-\frac{a}{b}}{1-\frac{1}{b}}=\frac{\frac{ab-a}{b}}{\frac{b-1}{b}}=\frac{a(b-1)}{b-1}=a$

32.) $\frac{1-\frac{1}{x}}{1+\frac{1}{x}}=\frac{\frac{x-1}{x}}{\frac{x+1}{x}}=\frac{x-1}{x+1}$

33.) $\frac{\frac{1}{x+1}+1}{\frac{1}{x+1}-1}=\frac{\frac{1+x+1}{x+1}}{\frac{1-x-1}{x+1}}=\frac{2+x}{-x}=-\frac{2+x}{x}$

34.) $\frac{\frac{a}{a-b}+\frac{b}{a+b}}{\frac{a}{a+b}-\frac{b}{a-b}}=\frac{\frac{a(a+b)+b(a-b)}{a^2-b^2}}{\frac{(a+b)b-(a-b)a}{ab}}=$

$=\frac{\frac{a^2+ab+ab-b^2}{a^2-b^2}}{\frac{ab+b^2-a^2+ab}{ab}}=\frac{ab(a^2+2ab-b^2)}{(a^2-b^2)(-a^2+2ab+b^2)}$

Kvadriranje i drugi korijen dekadskih brojeva

§63. Kvadriranje.

1.) 30^2 — $3^2=9$; $2\cdot3\cdot0=0$; $0^2=0$ → 900

41^2 — $4^2=16$; $2\cdot4\cdot1=8$; $1^2=1$ → 1681

56^2 — $5^2=25$; $2\cdot5\cdot6=60$; $6^2=36$ → 3136

$80^2 = 6400$

93^2
$9^2 = 81$
$2 \cdot 9 \cdot 3 = 54$
$3^2 = 9$
8649

99^2
$9^2 = 81$
$2 \cdot 9 \cdot 9 = 162$
$9^2 = 81$
9801

2.) $13^2 = 169$; $24^2 = 576$; $46^2 = 2116$; $54^2 = 2916$
$62^2 = 3844$; $87^2 = 7569$

3.) 234^2
$2^2 = 4$
$43 \cdot 3 = 129$
$464 \cdot 4 = 1856$
54756

207^2
$2^2 = 4$
$407 \cdot 7 = 2849$
42849

564^2
$52 = 25$
$106 \cdot 6 = 636$
$1124 \cdot 4 = 4496$
318096

678^2
$6^2 = 36$
$127 \cdot 7 = 889$
$1348 \cdot 8 = 10784$
459684

683^2
$6^2 = 36$
$128 \cdot 8 = 1024$
$1363 \cdot 3 = 4089$
466489

984^2
$9^2 = 81$
$188 \cdot 8 = 1504$
$1964 \cdot 4 = 7856$
968256

1035^2
$1^2 = 1$
$203 \cdot 3 = 609$
$2065 \cdot 5 = 10325$
1071225

2401^2
$2^2 = 4$
$44 \cdot 4 = 176$
$480 \cdot 1 = 4801$
5764801

3526^2
$3^2 = 9$
$65 \cdot 5 = 325$
$702 \cdot 2 = 1404$
$7046 \cdot 6 = 42276$
12432676

4737^2
$4^2 = 16$
$87 \cdot 7 = 609$
$943 \cdot 3 = 2829$
$9467 \cdot 7 = 66269$
22439169

8007^2
$8^2 = 64$
$16007 \cdot 7 = 112049$
64112049

8078^2
$8^2 = 64$
$1607 \cdot 7 = 11249$
$16148 \cdot 8 = 129184$
65254084

1736^2
$9^2 = 81$
$187 \cdot 7 = 1309$
$1343 \cdot 3 = 5829$
$14466 \cdot 6 = 116796$
94789696

30524^2
$3^2 = 9$
$605 \cdot 5 = 3025$
$6102 \cdot 2 = 12204$
$61044 \cdot 4 = 244176$
931714576

56072^2
$5^2 = 25$
$106 \cdot 6 = 636$
$11207 \cdot 7 = 78449$
$112142 \cdot 2 = 224284$
3144069184

72395^2
$7^2 = 49$
$142 \cdot 2 = 284$
$1443 \cdot 3 = 4329$
$14469 \cdot 9 = 130221$
$144785 \cdot 5 = 723925$
5241036025

$\left(\frac{12}{15}\right)^2 = \frac{12^2}{15^2} = \frac{144}{225}$; $\left(\frac{39}{58}\right)^2 = \frac{1521}{3364}$

$\left(6\frac{9}{5}\right)^2 = \left(\frac{39}{5}\right)^2 = \frac{1521}{25}$; $\left(6\frac{5}{9}\right)^2 = \left(\frac{59}{9}\right)^2 = \frac{3481}{81}$

$\left(12\frac{7}{13}\right)^2 = \left(\frac{163}{13}\right)^2 = \frac{26569}{169}$

4.) 7.5^2
$7^2 = 49$
$145 \cdot 5 = 725$
56.25

0.75^2
$7^2 = 49$
$145 \cdot 5 = 725$
0.5625

$6 \cdot 56^2$

$6^2 = 36$

$125 \cdot 5 = 625$

$130_6 \cdot 6 = 7836$

430336

$38 \cdot 724^2$

$3^2 = 9$

$68 \cdot 8 = 544$

$767 \cdot 7 = 5369$

$774_2 \cdot 2 = 15484$

$77444 \cdot 4 = 309776$

1499548176

Ne može, jer se uzima dvostruk broj dana = maksimalnom mjesta zadanog broja.

5.) $0{,}\dot{6}^2 = \left(\frac{6}{9}\right)^2 = \left(\frac{2}{3}\right)^2 = \frac{4}{9}$

$0{,}\dot{2}\dot{7}^2 = \left(\frac{27}{99}\right)^2 = \left(\frac{3}{11}\right)^2 = \frac{9}{121}$

$5{,}3\dot{6}^2 = \left(5\frac{36-3}{90}\right)^2 = \left(5\frac{33}{90}\right)^2 = \left(5\frac{11}{30}\right)^2 = \left(\frac{161}{30}\right)^2 = \frac{25921}{900}$

$2{,}3\dot{2}\dot{4}^2 = \left(2\frac{324-3}{990}\right)^2 = \left(2\frac{321}{990}\right)^2 = \left(2\frac{107}{330}\right)^2 = \left(\frac{767}{330}\right)^2 = \frac{588289}{108900}$

§64. Drugi korijen.

1.) $48^2 = 2304$

$\sqrt{2304} = 48$

16

$704 : 8_8$

704

$= = =$

134^2

169

1056

17956

$\sqrt{17956} = 134$

$1 = 79 : 2_3$

$1056 : 26_4$

$= = = =$

563^2

25

636

3369

316969

$\sqrt{316969} = 563$

$669 : 10_6$

$3369 : 112_3$

$= = = =$

807^2

64

11249

651249

$\sqrt{6512\,49} = 807$

$112 : 16$

$11249 : 1607$

$= = = = =$

7645^2

49

876

6096

76425

58446025

$\sqrt{58446025} = 7645$

$944 : 14_6$

$6860 : 1524$

$76425 : 1528_5$

$= = = = =$

3086^2

9

4864

36996

9523396

$\sqrt{9523396} = 3086$

$= 52 : 6$

$5233 : 608$

$36996 : 6166$

$= = = = =$

6005^2

36

060025

36060025

$\sqrt{36060025} = 6005$

$= = 06 : 12$

$600 : 120$

$60025 : 12005$

$= = = = =$

2.) a.) $\sqrt{2\,85\,61} = 169$

$185 : 26$

$2961 : 329$

$= = = =$

b.) $\sqrt{61\,46\,56} = 784$

$1246 : 148$

$6256 : 1564$

$= = = =$

c.) $\sqrt{70\,72\,81} = 841$

$672 : 164$

$1681 : 1681$

$= = = =$

d.) $\sqrt{187\,41\,61} = 1369$

$= 87 : 23$

$1841 : 2666$

$24561 : 27229$

$= = = = =$

e.) $\sqrt{4879681} = 2209$

$87 : 42$

$396 : 44$

$39681 : 4409$

$= = = = =$

f.) $\sqrt{54\,70\,08\,16} = 7396$

$570 : 143$

$14108 : 1469$

$88716 : 14786$

$= = = = =$

3.) a.) $\sqrt{45^2 + 28^2} = \sqrt{2025 + 784} = \sqrt{2809} = 53$

b) $\sqrt{247^2 + 96^2} = \sqrt{01009 + 9216} = \sqrt{70225} = 265$

c.) $\sqrt{73^2-48^2} = \sqrt{(73+48)(73-48)} = \sqrt{121 \cdot 25} =$
$= 11 \cdot 5 = 55$

Kod ovog zadatka upotrijebljena je formula: $a^2-b^2=(a+b)(a-b)$. Na taj način dobije se korijen iz produkta dvaju brojeva. Iz produkta dvaju ili više brojeva može se korijen tako, da se iz svakog faktora izvadi korijen, i dobiveni brojevi međusobno izmnože. N.p. $\sqrt{a^2b^2x^2} = abx$

d.) $\sqrt{85^2-36^2} = \sqrt{(85+36)(85-36)} = \sqrt{121 \cdot 49} =$
$= 11 \cdot 7 = 77$

e.) $\sqrt{593^2-465^2} = \sqrt{(593+465)(593-465)} =$
$= \sqrt{1058 \cdot 128} = \sqrt{529 \cdot 2 \cdot 64 \cdot 2} = \sqrt{529 \cdot 64 \cdot 4} =$
$= 23 \cdot 8 \cdot 2 = 368$

f.) $\sqrt{3249} + \sqrt{1089} = 57 + 33 = 90$

g.) $\sqrt{6241} - \sqrt{4624} = 79 - 68 = 11$

II. Drugi korijen iz decimalnih brojeva.

1.) a.) $\sqrt{112 \cdot 36} = 10 \cdot 6$
12 : 2
1236 : 20$_6$
= = = =

b.) $\sqrt{10\,49\,76} = 3 \cdot 24$
149 : 6$_2$
2576 : 64$_4$
= = = =

c.) $\sqrt{1131 \cdot 6496} = 33 \cdot 4$
231 : 6$_3$
4264 : 66$_6$
26896 : 672$_4$
= = = = =

d.) $\sqrt{0 \cdot 2401} = 0 \cdot 49$
16
801 : 8$_9$
= = =

e.) $\sqrt{0 \cdot 00\,23\,04} = 0 \cdot 048$
16
704 : 8$_8$
= = =

f.) $\sqrt{0 \cdot 00\,75\,69} = 0 \cdot 087$
64
1169 : 16$_7$
= = = =

2.) a.) $\sqrt{23\,54\,83} = 4 \cdot 85\ldots$
754 : 8$_8$
5083 : 96$_5$
258

b.) $\sqrt{154 \cdot 2970} = 12 \cdot 421\ldots$
54 : 2$_2$
1029 : 24$_4$
5370 : 248$_2$
40600 : 2484$_1$
15759

c.) $\sqrt{0 \cdot 08\,74} = 0 \cdot 295\ldots$
474 : 4$_9$
3300 : 58$_5$
375

d.) $\sqrt{0 \cdot 60} = 0 \cdot 774\ldots$
1100 : 14$_7$
7100 : 154$_4$
924

e.) $\sqrt{0 \cdot 10} = 0 \cdot 3162\ldots$
100 : 6$_1$
3900 : 62$_6$
14400 : 632$_2$
1756

f.) $\sqrt{0 \cdot 01} = 0 \cdot 1$
==

g.) $\sqrt{0 \cdot 00\,70} = 0 \cdot 0836\ldots$
600 : 16$_3$
11100 : 166$_6$
1104

h.) $\sqrt{28 \cdot 74} = 5 \cdot 361\ldots$
374 : 10$_3$
6574 : 106$_6$
17874 : 1071$_1$
7153

i.) $\sqrt{0 \cdot 78} = 0 \cdot 888\ldots$
1488 : 16$_8$
14488 : 176$_8$
344

k.) $\sqrt{0 \cdot 0472} = 0 \cdot 2172\ldots$
72 : 4$_1$
3100 : 427
11100 : 4342
2416

3.) a.) $\sqrt{3} = 1 \cdot 7320\ldots$
200 : 27
1100 : 343
7100 : 3462
17600 : 3464

b.) $\sqrt{7} = 2 \cdot 6457\ldots$
300 : 4$_6$
2408 : 524
30400 : 5285
397500 : 52907
27151

c.) $\sqrt{40} = 6 \cdot 324\ldots$
400 : 12$_3$
3100 : 1262
57600 : 12644
7024

d.) $\sqrt{54} = 7 \cdot 348\ldots$
500 : 14$_3$
7100 : 1464
124400 : 14688
6896

e.) $\sqrt{13,87} = 37 \cdot 242$

$487 : 67$

$1800 : 74_2$

$31600 : 744_4$

$182400 : 7448_2$

33436

III. Drugi korijen iz razlomaka.

1.) a.) $\sqrt{\frac{16}{49}} = \frac{\sqrt{16}}{\sqrt{49}} = \frac{4}{7}$ b.) $\sqrt{\frac{324}{169}} = \frac{\sqrt{324}}{\sqrt{169}} = \frac{18}{13}$

c.) $\sqrt{2\frac{126}{225}} = \sqrt{\frac{576}{225}} = \frac{24}{15} = \frac{8}{5}$

d.) $\sqrt{\frac{108}{147}} = \sqrt{\frac{36}{49}} = \frac{6}{7}$

2.) a.) $\sqrt{\frac{5}{6}} = \sqrt{\frac{30}{36}} = \frac{\sqrt{30}}{6} = \frac{5 \cdot 47}{6} = 0 \cdot 91\ldots$

Drugi način $\sqrt{\frac{5}{6}} = \sqrt{0 \cdot 83} = 0 \cdot 91\ldots$

b.) $\sqrt{3\frac{1}{2}} = \sqrt{\frac{7}{2}} = \frac{\sqrt{14}}{2} = \frac{3 \cdot 741}{2} = 1 \cdot 870\ldots$

Drugi način: $\sqrt{3\frac{1}{2}} = \sqrt{3 \cdot 5} = 1 \cdot 870\ldots$

c.) $\sqrt{7\frac{3}{5}} = \sqrt{\frac{38}{5}} = \frac{\sqrt{190}}{5} = \frac{13 \cdot 77}{5} = 2 \cdot 77\ldots$

Drugi način $\sqrt{7\frac{3}{5}} = \sqrt{7 \cdot 6} = 2 \cdot 77\ldots$

d.) $\sqrt{28\frac{4}{15}} = \sqrt{\frac{424}{15}} = \frac{\sqrt{6360}}{225} = \frac{78 \cdot 74}{15} = 5 \cdot 31\ldots$

Drugi način: $\sqrt{28\frac{4}{15}} = \sqrt{28 \cdot 26} = 5 \cdot 31\ldots$

e.) $\sqrt{53\frac{1}{8}} = \sqrt{\frac{425}{8}} = \frac{\sqrt{850}}{16} = \frac{29 \cdot 15}{4} = 7 \cdot 28\ldots$

Drugi način: $\sqrt{53\frac{1}{8}} = \sqrt{53 \cdot 125} = 7 \cdot 28\ldots$

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§65. Kubiranje.

I. Vježbe.

1.) a.) $(x+1)^3 = x^3 + 3x^2 + 3x + 1 = 8 + 12 + 6 + 1 = 27 = 3^3$

b.) $(x-1)^3 = x^3 - 3x^2 + 3x - 1 = 8 - 12 + 6 - 1 = 1 = 1^3$

c.) $(2x+1)^3 = 8x^3 + 12x^2 + 6x + 1 = 64 + 48 + 12 + 1 = 125 = 5^3$

d.) $(2a-3)^3 = 8a^3 - 36a^2 + 54a - 27 = 64 - 144 + 108 - 27 =$

$= 1 = 1^3$

e.) $(4a+b)^3 = 64a^3 + 48a^2b + 12ab^2 + b^3 =$

$= 1728 + 3024 + 1764 + 343 = 6859 = 19^3$

f.) $(5a-2b)^3 = 125a^3 - 150a^2b + 60ab^2 - 8b^3 =$

$= 3375 - 9450 + 8820 - 2744 = 1 = 1^3$

g.) $(7-2a)^3 = 343 - 294a + 84a^2 - 8a^3 =$

$= 343 - 882 + 756 - 216 = 1 = 1^3$

2.) a.) $(a+b+2)^3 = a^3 + 3a^2b + 3ab^2 + b^3 + 6a^2 +$

$+ 12ab + 6b^2 + 12a + 12b + 8$

b.) $(x-y+2)^3 = (x-y)^3 + 3(x-y)^2 \cdot 2 + 3(x-y) \cdot 2^2 + 2^3 =$

$= x^3 - 3x^2y + 3xy^2 - y^3 + 6x^2 - 12xy + 6y^2 + 12x - 12y + 8 =$

$= 64 - 240 + 300 - 125 + 96 - 240 + 150 + 48 - 60 + 8 = 1 = 1^3$

3.) a.) $(a+b)^3 + (a-b)^3 = a^3 + 3a^2b + 3ab^2 + b^3 + a^3 - 3a^2b +$

$+ 3ab^2 - b^3 = 2a^3 + 6ab^2 = 16 + 12 = 28 = 3^3 + 1^3$

b.) $(a+b)^3 - (a-b)^3 = a^3 + 3a^2b + 3ab^2 + b^3 - a^3 + 3a^2b -$

$- 3ab^2 + b^3 = 6a^2b + 2b^3 = 24 + 2 = 26 = 3^3 - 1^3$

c.) $x^3 - (x-y)^3 = x^3 - (x^3 - 3x^2y + 3xy^2 - y^3) =$

$= x^3 - x^3 + 3x^2y - 3xy^2 + y^3 = 3x^2y - 3xy^2 + y^3 = 225 - 135 + 27 =$

$= 117 = 125 - 8$

d.) $x(x+1)(x+2) - (x+1)^3 = (x^2+x)(x+2) - (x^3 + 3x^2 + 3x + 1) =$

$= x^3 + 3x^2 + 2x - x^3 - 3x^2 - 3x - 1 = -x - 1 = -6 - 1 = -7$

$6(6+1)(6+2) - (6+1)^3 = 336 - 343 = -7$

II. Vježbe

1.) a.) $30^3 = 27000$ b.) $600^3 = 216000000$

c.) $800^3 = 512000000$

d.) $4000^3 = 64000000000$

2.) a.) $(4D)^3 = 64T = 64000$

b.) $(7S)^3 = 343M = 343000000$

c.) $(2T)^3 = 8tM = 8000000000$

3.) a.) $0{\cdot}7^3 = 0{\cdot}343$

b.) $0{\cdot}05^3 = 0{\cdot}000125$

c.) $0{\cdot}002^3 = 0{\cdot}000000008$

d.) $0{\cdot}0009^3 = 0{\cdot}000000000729$

4.) a.) $(8d)^3 = 512t = 0{\cdot}512$

b.) $(3s)^3 = 27m = 0{\cdot}000027$

c.) $(1t)^3 = 1tm = 0{\cdot}000000001$

d.) $(7t)^3 = 343tm = 0{\cdot}000000343$

III. Vježbe.

1.) a.) 16^3

$1^3 = 1$
$3.1^2.6 = 18$
$3.1.6^2 = 108$
$6^3 = 216$
4096

2.) 19^3

$1^3 = 1$
$3.1^2.9 = 27$
$3.1.9^2 = 243$
$9^3 = 729$
6859

c.) 24^3

$2^3 = 8$
$3.2^2.4 = 48$
$3.2.4^2 = 96$
$4^3 = 64$
13824

d.) 27^3

$2^3 = 8$
$3.2^2.7 = 84$
$3.2.7^2 = 294$
$7^3 = 343$
19683

e.) 38^3

$3^3 = 27$
$3.3^2.8 = 216$
$3.3.8^2 = 576$
$8^3 = 512$
54872

f.) 54^3

$5^3 = 125$
$3.5^2.4 = 300$
$3.5.4^2 = 240$
$4^3 = 64$
157464

g.) 76^3

$7^3 = 343$
$3.7^2.6 = 882$
$3.7.6^2 = 756$
$6^3 = 216$
438976

h.) 81^3

$8^3 = 512$
$3.8^2.1 = 192$
$3.8.1^2 = 24$
$1^3 = 1$
531441

2.) a.) 124^3

$1^3 = 1$
$3.1^2.2 = 6$
$3.1.2^2 = 12$
$2^3 = 8$
$3.12^2.4 = 1728$
$3.12.4^2 = 576$
$4^3 = 64$
1906624

b.) 116^3

$1^3 = 1$
$3.1^2.1 = 3$
$3.1.1^2 = 3$
$1^3 = 1$
$3.11^2.6 = 2178$
$3.11.6^2 = 1188$
$6^3 = 216$
1560896

c.) 407^3

$4^3 = 64$
$3.4^2.0 = 0$
$3.4.0^2 = 0$
$0^3 = 0$
$3.40^2.7 = 33600$
$3.40.7^2 = 5880$
$7^3 = 343$
67419143

d.) 2145^3

$2^3 = 8$
$3.2^2.1 = 12$
$3.2.1^2 = 6$
$1^3 = 1$
$3.21^2.4 = 5292$
$3.21.4^2 = 1008$
$4^3 = 64$
$3.214^2.5 = 686940$
$3.214.5^2 = 16050$
$5^3 = 125$
9869198625

f.) 2007^3

$2^3 = 8$
$3.200^2.7 = 840000$
$3.200.7^2 = 29400$
$7^3 = 343$
8084294343

e.) 2056^3

$2^3 = 8$
$3.20^2.5 = 6000$
$3.20.5^2 = 1500$
$5^3 = 125$
$3.205^2.6 = 756450$
$3.205.6^2 = 22140$
$6^3 = 216$
8690991616

g.) 7641^3

$7^3 = 343$
$3 \cdot 7^2 \cdot 6 = 882$
$3 \cdot 7 \cdot 6^2 = 756$
$6^3 = 216$
$3 \cdot 76^2 \cdot 4 = 69312$
$3 \cdot 76 \cdot 4^2 = 3648$
$4^3 = 64$
$3 \cdot 764^2 \cdot 1 = 1751088$
$3 \cdot 764 \cdot 1^2 = 2292$
$1^3 = 1$
$= 446188757721$

Kubiranje decimalnih brojeva i racionalnih.

1.) a.) $1 \cdot 4^3$

$1^3 = 1$
$3 \cdot 1^2 \cdot 4 = 12$
$3 \cdot 1 \cdot 4^2 = 48$
$4^3 = 64$
$= 2744$

b.) $2 \cdot 7^3$

$2^3 = 8$
$3 \cdot 2^2 \cdot 7 = 84$
$3 \cdot 2 \cdot 7^2 = 294$
$7^3 = 343$
$= 19.683$

c.) $8 \cdot 6^3$

$8^3 = 512$
$3 \cdot 8^2 \cdot 6 = 1152$
$3 \cdot 8 \cdot 6^2 = 864$
$6^3 = 216$
$= 636.056$

d.) $0 \cdot 45^3$

$4^3 = 64$
$3 \cdot 4^2 \cdot 5 = 240$
$3 \cdot 4 \cdot 5^2 = 300$
$5^3 = 125$
$= 0.091125$

e.) $0 \cdot 0078^3$

$7^3 = 343$
$3 \cdot 7^2 \cdot 8 = 1176$
$3 \cdot 7 \cdot 8^2 = 1344$
$8^3 = 512$
$= 0.000000474552$

2.) a.) $3 \cdot 14^3$

$3^3 = 27$
$3 \cdot 3^2 \cdot 1 = 27$
$3 \cdot 3 \cdot 1^2 = 9$
$1^3 = 1$
$3 \cdot 31^2 \cdot 4 = 11532$
$3 \cdot 31 \cdot 4^2 = 1488$
$4^3 = 64$
$= 30.959.144$

b.) $2 \cdot 06^3$

$2^3 = 8 \ldots$
$3 \cdot 20^2 \cdot 6 = 7200$
$3 \cdot 20 \cdot 6^2 = 2160$
$6^3 = 216$
$= 8.741816$

c.) $0 \cdot 562^3$

$5^3 = 125$
$3 \cdot 5^2 \cdot 6 = 450$
$3 \cdot 5 \cdot 6^2 = 540$
$6^3 = 216$
$3 \cdot 56^2 \cdot 2 = 18816$
$3 \cdot 56 \cdot 2^2 = 672$
$2^3 = 8$
$= 0.177504328$

d.) $23 \cdot 4^3$

$2^3 = 8$
$3 \cdot 2^2 \cdot 3 = 36$
$3 \cdot 2 \cdot 3^2 = 54$
$3^3 = 27$
$3 \cdot 23^2 \cdot 4 = 6348$
$3 \cdot 23 \cdot 4^2 = 1104$
$4^3 = 64$
$= 12812.904$

e.) $0 \cdot 0857^3$

$8^3 = 512$
$3 \cdot 8^2 \cdot 5 = 960$
$3 \cdot 8 \cdot 5^2 = 600$
$5^3 = 125$
$3 \cdot 85^2 \cdot 7 = 151725$
$3 \cdot 85 \cdot 7^2 = 12495$
$7^3 = 343$
$= 0.000629422793$

f.) $42 \cdot 35^3$

$4^3 = 64$
$3 \cdot 4^2 \cdot 2 = 96$
$3 \cdot 4 \cdot 2^2 = 48$
$2^3 = 8$
$3 \cdot 42^2 \cdot 3 = 15876$
$3 \cdot 42 \cdot 3^2 = 1134$
$3^3 = 27$
$3 \cdot 423^2 \cdot 5 = 2683935$
$3 \cdot 423 \cdot 5^2 = 31725$
$5^3 = 125$
$= 75955677875$

g.) $72 \cdot 06^3$

$7^3 = 343$
$3 \cdot 7^2 \cdot 2 = 294$
$3 \cdot 7 \cdot 2^2 = 84$
$2^3 = 8 \ldots$
$3 \cdot 720^2 \cdot 6 = 9331200$
$3 \cdot 720 \cdot 6^2 = 77760$
$6^3 = 216$
$= 374188877816$

3.) a.) $\left(\frac{15}{17}\right)^3 = \frac{3375}{4913}$; b.) $\left(2\frac{5}{6}\right)^3 = \left(\frac{17}{6}\right)^3 = \frac{4913}{216}$

c.) $\left(45\frac{3}{4}\right)^3 = \left(\frac{183}{4}\right)^3 = \frac{6128487}{64}$

d.) $\left(62\frac{3}{8}\right)^3 = \left(\frac{499}{8}\right)^3 = \frac{124251499}{512}$

4.) a.) $\left(\frac{1}{2}\right)^3 = \frac{1}{8} = 0.125$; $\left(\frac{1}{2}\right)^3 = 0.5^3 = 0.125$

b.) $\left(\frac{4}{5}\right)^3 = \frac{64}{125} = 0.512$; $\left(\frac{4}{5}\right)^3 = 0.8^3 = 0.512$

c.) $(3\frac{1}{8})^3 = (\frac{25}{8})^3 = \frac{15625}{512} = 30{,}51757\,8125$

Drugi način: $(3\frac{1}{8})^3 = 3{,}125^3 = 30{,}51757\,8125$

d.) $(7\frac{3}{4})^3 = (\frac{31}{4})^3 = \frac{29791}{64} = 465{,}484375$

Drugi način: $(7\frac{3}{4})^3 = 7{,}75^3 = 465{,}484375$

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§.66. Treći korijen

1.) a.) 426^3

$4^3 = 64$
$3.4^2.2 = 96$
$3.4.2^2 = 48$
$2^3 = 8$
$3.42^2.6 = 31752$
$3.42.6^2 = 4536$
$6^3 = 216$
77308776

$\sqrt[3]{77308776} = 426$

64 | $133\,08 : 3.4^2 = (48)$ — $3.4^2.2$
96 | $48\,8$ — $3.4.2^2$
48 | 8 — 2^3
8 | $3220776 : 3.42^2 = (5292)$ — $3.4^2.6$
31752 | 4536 — $3.42.6^2$
4536 | 216 — 6^3
216 |
0

b.) 758^3

$7^3 = 343$
$3.7^2.5 = 735$
$3.7.5^2 = 525$
$5^3 = 125$
$3.75^2.8 = 135000$
$3.75.8^2 = 14400$
$8^3 = 512$
435519512

$\sqrt[3]{435519512} = 758$

343 | $92519 : 3.7^2 = (147)$ — $3.7^2.5$
735 | 525 — $3.7.5^2$
525 | 125 — 5^3
125 | $1364512 : 3.75^2 = (16875)$ — $3.75^2.8$
135000 | 14400 — $3.75.8^2$
14400 | 512 — 8^3
512 |
0

c.) 345^3

$3^3 = 27$
$3.3^2.4 = 108$
$3.3.4^2 = 144$
$4^3 = 64$
$3.34^2.5 = 17340$
$3.34.5^2 = 2550$
$5^3 = 125$
41063625

$\sqrt[3]{41063625} = 345$

27 | $14063 : 3.3^2 = (27)$ — $3.3^2.4$
108 | 144 — $3.3.4^2$
144 | 64 — 4^3
64 | $1759625 : 3.34^2 = (3468)$ — $3.34^2.5$
17340 | 2550 — $3.34.5^2$
2550 | 125 — 5^3
125 |
0

d.) 507^3

$5^3 = 125\ldots$
$3.50^2.7 = 52500$
$3.50.7^2 = 7350$
$7^3 = 343$
130323843

$\sqrt[3]{130323843} = 507$

125 | $=5323 : 3.5^2 = (75)$
$53238\,43 : 3.60^2 = (7500)$ — $3.50^2.7$
52500 | 7350 — $3.50.7^2$
7350 | 343 — 7^3
343 |
0

2.) a.) $\sqrt[3]{12167} = 23$

8 | $4167 : 3.2^2 = (12)$ — $3.2^2.3$
36 | 54 — $3.2.3^2$
54 | 27 — 3^3
27 |
0

b.) $\sqrt[3]{3375} = 15$

1 | $2375 : 3.1^2 = (3)$ — $3.1^2.5$
15 | 75 — $3.1.5^2$
75 | 125 — 5^3
125 |
0

c.) $\sqrt[3]{681472} = 88$

512 | $169472 : 3.8^2 = (192)$ — $3.8^2.8$
1536 | 1536 — $3.8.8^2$
1536 | 512 — 8^3
512 |
0

d.) $\sqrt[3]{1860867} = 123$

1 | $860 : 3.1^2 = (3)$ — $3.1^2.2$
6 | $12\,8$ — $3.1.2^2$
12 | 8 — 2^3
8 | $132867 : 3.12^2 = (432)$ — $3.12^2.3$
1296 | 324 — $3.12.3^2$
324 | 27 — 3^3
27 |
0

e.) $\sqrt[3]{887503681} = 961$

729 | $158503 : 3.9^2 = (243)$ — $3.9^2.6$
1458 | 972 — $3.9.6^2$
972 | 216 — 6^3
216 | $2767681 : 3.96^2 = (27648)$ — $3.96^2.1$
27648 | $288\,1$ — $3.96.1^2$
288 | 1 — 1^3
1 |
0

f.) $\sqrt[3]{2\,176\,782\,336} = 1296$

1
1 176 : $3.1^2 = (3)$
6 $3.1^2.2$
12 8 $3.1.2^2$
2^3
448 782 : $3.12^2 = (432)$
3888 $3.12^2.9$
2916 $3.12.9^2$
729 9^3
30093 336 : $3.129^2 = (49923)$
29538 $3.129^2.6$
13932 $3.129.6^2$
216 6^3

g.) $\sqrt[3]{481\,890\,304} = 784$
343
138 890 : $3.7^2 = (147)$
11 76 $3.7^2.8$
1344 $3.7.8^2$
512 8^3
733 83 04 : $3.78^2 = (18252)$
73008 $3.78^2.4$
3744 $3.78.4^2$
64 4^3

h.) $\sqrt[3]{225\,199\,600\,704} = 6084$
216
9 199 : $3.6^2 = (108)$
9 199 600 : $3.60^2 = (10800)$
8640 0 $3.60^2.8$
1152 0 $3.60.8^2$
512 8^3
4438 887 04 : $3.608^2 = (1108992)$
4435968 $3.608^2.4$
2918 4 $3.608.4^2$
64 4^3

Zadania.

1.) a.) $\sqrt[3]{262\,144} = 64$
216
46 144 : $3.6^2 = (108)$
432 $3.6^2.4$
288 $3.6.4^2$
64 4^3

b.) $\sqrt[3]{16\,777\,216} = 256$
8
8 777 : $3.2^2 = (12)$
60 $3.2^2.5$
150 $3.2.5^2$
125 5^3
1152 216 : $3.25^2 = (1875)$
11250 $3.25^2.6$
2700 $3.25.6^2$
216 6^3

c.) $\sqrt[3]{3\,176\,523} = 147$
1
2 176 : $3.1^2 = (3)$
12 $3.1^2.4$
48 64 $3.1.4^2$
4^3
4325 23 : $3.14^2 = (588)$
4116 $3.14^2.7$
2058 $3.14.7^2$
343 7^3

d.) $\sqrt[3]{0.262\,144} = 0.64$
216
46 144 : $3.6^2 = (108)$
432 $3.6^2.4$
288 $3.6.4^2$
64 4^3

e.) $\sqrt[3]{0.013\,824} = 0.24$
8
5 824 : $3.2^2 = 12$
48 $3.2^2.4$
96 $3.2.4^2$
64 4^3

f.) $\sqrt[3]{0.713} = 0.893\ldots$
512
201 000 : $3.8^2 = (192)$
1728
1944
729
803 100 00 : $3.89^2 = (23763)$
71289 $3.89^2.3$
2403 $3.89.3^2$
27 3^3
878043

g.) $\sqrt[3]{0{,}004130} = 0{,}1604\ldots$

$\frac{1}{3}130 : 3.1^2 = (3)$; 18 $3.1^2 6$; 108 $3.1.6^2$; 216 6^3

$34000 : 3.16^2 = (768)$

$34000000 : 3.160^2 = (76800)$

307200 $3.160^2 4$; 7680 $3.160.4^2$; 64 4^3

3203136

h.) $\sqrt[3]{0{,}400} = 0{,}736\ldots$

$\frac{343}{}57000 : 3.7^2 = (147)$

441 $3.7^2 3$; 189 $3.7.3^2$; 27 3^3

$10983000 : 3.73^2 = (15987)$

95922 $3.73^2 6$; 7884 $3.73.6^2$; 216 6^3

13117744

2.)a.) $\sqrt[3]{2} = 1{,}25\ldots$

$\frac{1}{1}000 : 3.1^2 = (3)$

92 $3.1^2 2$; 8 $3.1.2^2$; 2^3

$272000 : 3.12^2 = (432)$

2160 $3.12^2 5$; 900 $3.12.5^2$; 125 5^3

46875

b.) $\sqrt[3]{3} = 1{,}44\ldots$

$\frac{1}{2}000 : 3.1^2 = (3)$

12 $3.1^2 4$; 48 $3.1.4^2$; 64 4^3

$256000 : 3.14^2 = (588)$

2352 $3.14^2 4$; 672 $3.14.4^2$; 64 4^3

140116

c.) $\sqrt[3]{20} = 2{,}71\ldots$

$\frac{8}{}12000 : 3.2^2 = (12)$

84 $3.2^2 7$; 294 $3.2.7^2$; 343 7^3

$317000 : 3.27^2 = (2187)$

2187 $3.27^2 1$; 81 $3.27.1^2$; 1 1^3

97489

d.) $\sqrt[3]{65} = 4{,}02\ldots$

$\frac{64}{}1000 : 3.4^2 = (48)$

$1000000 : 3.40^2 = (4800)$

9600 $3.40^2 2$; 480 $3.40.2^2$; 8 2^3

35192

e.) $\sqrt[3]{510} = 7{,}98\ldots$

$\frac{343}{}167000 : 3.7^2 = (147)$

1323 $3.7^2 9$; 1701 $3.7.9^2$; 729 9^3

$16961000 : 3.79^2 = (18723)$

149784 $3.79^2 8$; 15168 $3.79.8^2$; 512 8^3

1830408

f.) $\sqrt[3]{1005} = 10{,}01$

$\frac{1}{}005 : 3.1^2 = (3)$

$5000 : 3.10^2 = (300)$

$5000000 : 3.100^2 = (30000)$

30000 $3.100^2 1$; 300 $3.100.1^2$; 1 1^3

1996999

g.) $\sqrt[3]{8539} = 20{,}43$

$\frac{8}{}539 : 3.2^2 = (12)$

$539000 : 3.20^2 = (1200)$

4800 $3.20^2 4$; 960 $3.20.4^2$; 64 4^3

$49336000 : 3.204^2 = (124848)$

37544 $3.204^2 3$; 5508 $3.204.3^2$; 27 3^3

11826493

III. Zavolocci

1.)a.) $\sqrt[3]{\frac{512}{729}} = \frac{8}{9}$; b.) $\sqrt[3]{\frac{2744}{2197}} = \frac{14}{13}$

c.) $\sqrt[3]{1\frac{3429}{5832}} = \sqrt[3]{\frac{9261}{5832}} = \frac{21}{18} = \frac{7}{6}$

d.) $\sqrt[3]{2\frac{749}{1313}} = \sqrt[3]{\frac{3375}{1313}} = \frac{15}{\sqrt[3]{1313}} = \frac{15}{10{,}95\ldots}$

2.) a.) $\sqrt[3]{\frac{3}{4}} = \sqrt[3]{0{,}750} = 0{,}908\ldots$

729

210000 : $3 \cdot 9^2 = (243)$

21000000 : $3 \cdot 90^2 = (24300)$

1944000 $\quad 3 \cdot 90^2 \cdot 8$

172800 $\quad 3 \cdot 90 \cdot 8^2$

5120 $\quad 8^3$

13866880

Drugi način: $\sqrt[3]{\frac{3}{4}} = \frac{1{,}44\ldots}{1{,}58\ldots} = 0{,}908\ldots$

b.) $\sqrt[3]{3\frac{1}{2}} = \sqrt[3]{\frac{7}{2}} = \sqrt[3]{\frac{28}{8}} = \frac{3{,}03}{2} = 1{,}51\ldots$

$\sqrt[3]{3\frac{1}{2}} = \sqrt[3]{3{,}5} = 1{,}518$

1

25000 : $3 \cdot 1^2 = (3)$

15 $\quad 3 \cdot 1^2 \cdot 5$

75 $\quad 3 \cdot 1 \cdot 5^2$

125 $\quad 5^3$

125000000 : $3 \cdot 15^2 = (675)$

6750

45 1

570490000 : $3 \cdot 151^2 = (68403)$

5472240 $\quad 3 \cdot 151^2 \cdot 8$

28992 $\quad 3 \cdot 151 \cdot 8^2$

5120 $\quad 8^3$

20361680

c.) $\sqrt[3]{12\frac{3}{5}} = \sqrt[3]{\frac{63}{5}} = \sqrt[3]{\frac{1575}{125}} = \frac{11{,}63}{5} = 2{,}32\ldots$

$\sqrt[3]{12\frac{3}{5}} = \sqrt[3]{12{,}6} = 2{,}326\ldots$

8

4600 : $3 \cdot 2^2 = (12)$

36

54 $\quad 3 \cdot 2^2 \cdot 3$

27 $\quad 3 \cdot 2 \cdot 3^2$

3^3

4330000 : $3 \cdot 23^2 = (1587)$

317400 $\quad 3 \cdot 23^2 \cdot 2$

27680 $\quad 3 \cdot 23 \cdot 2^2$

23^3

112832000 : $3 \cdot 232^2 = (161472)$

9688832

250560

2160

156980224

d.) $\sqrt[3]{8\frac{14}{15}} = \sqrt[3]{8{,}93} = 2{,}074\ldots$

8

933 : $3 \cdot 2^2 = (12)$

93333 : $3 \cdot 20^2 = (1200)$

84000 $\quad 3 \cdot 20^2 \cdot 7$

2940 $\quad 3 \cdot 20 \cdot 7^2$

343 $\quad 7^3$

6359033 : $3 \cdot 207^2 = (128547)$

5741880 $\quad 3 \cdot 207^2 \cdot 4$

99364 $\quad 3 \cdot 207 \cdot 4^2$

64 $\quad 4^3$

120721096

$\sqrt[3]{8\frac{14}{15}} = \sqrt[3]{\frac{134}{15}} = \sqrt[3]{\frac{134 \cdot 15^2}{15^3}} = \sqrt[3]{\frac{30150}{15^3}} = \frac{31{,}12}{15} = 2{,}07\ldots$

$\sqrt[3]{30150} = 31{,}12$

27

3150 : $3 \cdot 3^2 = (27)$

27 $\quad 3 \cdot 3^2 \cdot 1$

9 $\quad 3 \cdot 3 \cdot 1^2$

1 $\quad 1^3$

3590000 : $3 \cdot 31^2 = (2883)$

2883 $\quad 3 \cdot 31^2 \cdot 1$

93 $\quad 3 \cdot 31 \cdot 1^2$

1 $\quad 1^3$

69769000 : $3 \cdot 311^2 = (290163)$

5803260 $\quad 3 \cdot 311^2 \cdot 2$

37328 $\quad 3 \cdot 311 \cdot 2^2$

8 $\quad 2^3$

11699072

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§ 69. Rješavanje linearnih jednadžbi s jednom nepoznanicom.

1.) $x + 4 = 7$

$x = 7 - 4$

$x = 3$

2.) $x - 6 = 5$

$x = 5 + 6$

$x = 11$

3.) $5 + x = 7$

$x = 7 - 5$

$x = 2$

4.) $x + 4\frac{1}{2} = 7\frac{3}{4}$

$x = \frac{31}{4} - \frac{9}{2}$

$x = \frac{31}{4} - \frac{18}{4}$

$x = \frac{13}{4} = 3\frac{1}{4}$

5.) $x - 3\frac{3}{4} = 6\frac{1}{4}$

$x = \frac{25}{4} + \frac{15}{4}$

$x = \frac{40}{4}$

$x = 10$

6.) $3 \cdot 4 + x = 5\frac{1}{2}$

$x = 5 \cdot 5 - 3 \cdot 4$

$x = 2 \cdot 1$

7.) $8 - x = 2\frac{3}{5}$

$x - 8 = -2\frac{3}{5}$

$x = 8 - 2\frac{3}{5}$

$x = 5\frac{2}{5}$

8.) $x - 3a = 7a$

$x = 7a + 3a$

$x = 10a$

9.) $x - 5a = 2a$

$x = 2a + 5a$

$x = 7a$

10.) $x + 3m = n$

$x = n - 3m$

11.) $a = x + 5$

$-x = -a + 5$

$x = a - 5$

12.) $x + a - b = 0$

$x = b - a$

13.) $x - 2n + 7 = m$

$x = m + 2n - 7$

14.) $x - \frac{a}{3} = \frac{a}{6}$

$x = \frac{a}{6} + \frac{2a}{6}$

$x = \frac{3a}{6}$

$x = \frac{a}{2}$

15.) $\frac{a+b}{2} - x = \frac{a-b}{2}$

$-x = \frac{a-b}{2} - \frac{a+b}{2}$

$x = \frac{a+b}{2} - \frac{a-b}{2}$

$x = \frac{a+b-a+b}{2}$

$x = b$

16.) $\frac{m}{3} = x + \frac{m-1}{6}$

$-x = \frac{m-1}{6} - \frac{m}{3}$

$x = \frac{2m}{6} - \frac{m-1}{6}$

$x = \frac{2m - m + 1}{6}$

$x = \frac{m+1}{6}$

17.) $\frac{a}{3} = x + \frac{b}{3}$

$x = \frac{a}{3} - \frac{b}{3}$

$x = \frac{a-b}{3}$

18.) $\frac{m-n}{2} = x - \frac{3}{2}(m+n)$

$x = \frac{m-n}{2} + \frac{3m+3n}{2}$

$x = \frac{m - n + 3m + 3n}{2}$

$x = 2m + n$

19.) $4x = 20$

$x = \frac{20}{4}$

$x = 5$

20.) $2x = 6$

$x = \frac{6}{2}$

$x = 3$

21.) $3x + 2 = 18$

$3x = 16$

$x = \frac{16}{3}$

22.) $5x - 3 = 22$

$5x = 25$

$x = \frac{25}{5}$

$x = 5$

23.) $8x = -56$

$x = -\frac{56}{8}$

$x = -7$

24.) $7x = 64 - x$

$7x + x = 64$

$8x = 64$

$x = 8$

25.) $89 - 14x = -9$

$-14x = -89 - 9$

$-14x = -98$

$x = \frac{98}{14}$

$x = 7$

26.) $3x = a$

$x = \frac{a}{3}$

27.) $2x = a + b$

$x = \frac{a+b}{2}$

28.) $35x = 7$

$5x = 1$

$x = \frac{1}{5}$

29.) $5ax = 25a^2$

$x = 5a$

30.) $(a-b)x = a^2 - b^2$

$x = \frac{(a+b)(a-b)}{a-b}$

$x = a + b$

Pamti: $(a+b)(a-b) = a^2 - b^2$

Riječima: Zbroj puta razlika istih članova daje kao produkt razliku njihovih kvadrata.

31.) $0{\cdot}7x = 6{\cdot}3$

$\frac{x}{10} = 0{\cdot}9$

$x = 9$

32.) $1{\cdot}23x = 18{\cdot}45$

$x = \frac{1845}{123}$

$x = 15$

33.) $m^3 - n^3 = (m-n)x$

$x = \frac{m^3 - n^3}{m-n}$

$x = m^2 + mn + n^2$

34.) $\frac{x}{4} = 2$

$x = 4 \cdot 2 = 8$

35.) $\frac{x}{3} = a$

$x = 3a$

36.) $\frac{x}{0{\cdot}4} = 1$

$x = 0{\cdot}4$

37.) $\frac{x}{m} = n$

$x = mn$

38.) $\frac{x}{3a} = \frac{a}{3}$

$\frac{x}{a} = a$

$x = a^2$

39.) $\frac{x}{m-n} = m+n$

$x = (m+n)(m-n)$

$x = m^2 - n^2$

40.) $x : 2\frac{1}{3} = 5\frac{3}{4}$

$x : \frac{7}{3} = \frac{23}{4}$

$x = \frac{23}{4} \cdot \frac{7}{3}$

$x = \frac{161}{12} = 13\frac{5}{12}$

41.) $\frac{x}{5\frac{1}{2}} = 1\frac{1}{3}$

$\frac{x}{\frac{11}{2}} = \frac{4}{3}$

$x = \frac{4}{3} \cdot \frac{11}{2}$

$x = \frac{22}{3}$

42.) $7x - 4 = 24$

$7x = 28$

$x = 4$

43.) $11 + 19x = 49$

$19x = 38$

$x = 2$

44.) $63 - 7x = -35$

$7x = 98$

$x = 14$

45.) $4(x-3) = 16$

$x - 3 = 4$

$x = 7$

46.) $2(x+4) - 9 = 11$

$2(x+4) = 20$

$x + 4 = 10$

$x = 6$

47.) $3ax - a^2 = 2a^2 - 3ab$

$3ax = 3a^2 - 3ab$

$x = a - b$

48.) $7 + 3x + 5 = 2x + 30 - 5x$

$3x + 12 = -3x + 30$

$6x = 18$

$x = 3$

49.) $3x - 5 + 7x = 4 + 5x + 16$

$10x - 5 = 5x + 20$

$5x = 25$

$x = 5$

50.) $7(6x - 15) = 13(2x - 5)$

$42x - 105 = 26x - 65$

$42x - 26x = 105 - 65$

$16x = 40$

$x = \frac{5}{2}$

58.) Drugi način:

$7(6x - 15) = 13(2x - 5)$

$7[3(2x - 5)] = 13(2x - 5)$

$21(2x - 5) = 13(2x - 5)$

Ova jednadžba opisuje samo onda, ako je $2x - 5 = 0$. Iz toga slijedi $x = \frac{5}{2}$

51.) $3(3x-4) - 5x - 4(12 - 3x) = 14x$

$9x - 12 - 5x - 48 + 12x = 14x$

$9x - 5x + 12x - 14x = 12 + 48$

$2x = 60$

$x = 30$

52.) $5(4x-3) + 8(7 - 9x) = -11$

$20x - 15 + 56 - 72x = -11$

$20x - 72x = -11 + 15 - 56$

$-52x = -52 \; ; \; x = 1$

53.) $(2x-3)(5x-4) = (x-2)(4x-6)$

$10x^2 - 15x - 8x + 12 = 4x^2 - 8x - 6x + 12$

$10x^2 - 15x - 8x - 4x^2 + 8x + 6x = 12 - 12 = 0$

$6x^2 - 9x = 0$

$6x - 9 = 0 \; ; \; x = \frac{3}{2}$

54.) $5(x-8) = (x+3)(x-9) - (x+2)(x-10)$

$5x - 40 = x^2 + 3x - 9x - 27 - x^2 - 2x + 10x + 20$

$3x = 33 \; ; \; x = 11$

55.) $(m-2)(x-2) + (m-1)x = (m-1)(2x-3)$

$mx - 2x - 2m + 4 + mx - 1 = 2mx - 2x - 3m + 3$

$-x = -m - 1 \; ; \; x = m + 1$

56.) $\frac{6}{x} = 3$

$\frac{2}{x} = 1$

$x = 2$

57.) $\frac{7}{x} = 7$

$\frac{1}{x} = 1$

$x = 1$

58.) $\frac{28}{x} = 7$

$\frac{4}{x} = 1$

$x = 4$

59.) $\frac{a+b}{x} = 1$

$x = a + b$

60.) $\frac{m+n}{x} = m+n$

$\frac{1}{x} = 1$

$x = 1$

61.) $\frac{18a^2}{x} = 6a$

$\frac{3a}{x} = 1$

$x = 3a$

62.) $\frac{a^2 - b^2}{x} = a + b$

$\frac{a-b}{x} = 1$

$x = a - b$

63.) $\frac{8}{x-1}=2$

$\frac{4}{x-1}=1$

$x-1=4$

$x=5$

64.) $\frac{12}{7-x}=4$

$\frac{3}{7-x}=1$

$7-x=3$

$x=7-3=4$

65.) $\frac{14}{x+2}=3\frac{1}{2}$

$\frac{14}{x+2}=\frac{7}{2}$

$\frac{2}{x+2}=\frac{1}{2}$

$x+2=4$

$x=2$

66.) $\frac{3}{x}-8=4-\frac{1}{x}$

$\frac{3}{x}+\frac{1}{x}=4+8$

$\frac{4}{x}=12$

$\frac{1}{x}=3$

$1=3x$

$x=\frac{1}{3}$

67.) $\frac{8}{x}+3=6-\frac{4}{x}$

$\frac{8}{x}+\frac{4}{x}=6-3$

$\frac{12}{x}=3$

$\frac{4}{x}=1$

$x=4$

68.) $\frac{8}{x}+7+\frac{11}{x}=5+\frac{6}{x}+3$

$\frac{8}{x}+\frac{11}{x}-\frac{6}{x}=5+3-7$

$\frac{13}{x}=1$

$x=13$

69.) $\frac{9}{x-2}+9=14-\frac{6}{x-4}$

Jednadžba je razješnito kvadratična te potome ne spada ovamo.

70.) $\frac{5}{x-3}-10-\left(\frac{9}{x-3}-9\right)=3-\frac{10}{x-3}$

$\frac{5}{x-3}-10-\frac{9}{x-3}+9=3-\frac{10}{x-3}$

$\frac{5}{x-3}-\frac{9}{x-3}+\frac{10}{x-3}=3+10-9$

$\frac{6}{x-3}=4$

$6=4x-12\ ;\ 4x=18\ ;\ x=\frac{9}{2}$

71.) $\frac{x}{5}+\frac{6}{5}=\frac{11}{5}\ /5$

$x+6=11$

$x=5$

Brojem iza crte treba cijelu jednadžbu pomnožiti.

72.) $\frac{2x}{7}-\frac{3}{7}=\frac{11}{7}-\frac{5x}{7}\ /7$

$2x-3=11-5x$

$7x=14\ ;\ x=2$

73.) $\frac{x}{a+b}=\frac{5}{a+b}+\frac{2x}{a+b}\ /(a+b)$

$x=5+2x$

$x-2x=5$

$x=-5$

74.) $\frac{13}{67}-\frac{x}{67}=\frac{8}{67}\ /67$

$13-x=8$

$x=5$

75.) $\frac{5+x}{3}-\frac{7x}{3}=\frac{x+8}{3}\ /3$

$5+x-7x=x+8$

$-7x=3\ ;\ x=-\frac{3}{7}$

76.) $\frac{5x}{(a+b)m}=\frac{10}{(a+b)m}\ /(a+b)m$

$5x=10$

$x=2$

77.) $5-\frac{x}{3}=2$

$\frac{x}{3}=3$

$x=9$

78.) $\frac{x}{6}-2=3$

$\frac{x}{6}=5$

$x=30$

79.) $2x-\frac{3}{4}=\frac{x}{2}\ /4$

$8x-3=2x$

$6x=3$

$x=\frac{1}{2}$

80.) $\frac{3x-5}{2}=5$

$3x-5=10$

$3x=15$

$x=5$

81.) $\frac{3-x}{2}=\frac{x}{4}\ /4$

$2(3-x)=x$

$6-2x=x$

$3x=6$

$x=2$

82.) $\frac{4-3x}{5}=\frac{7}{10}\ /10$

$2(4-3x)=7$

$8-6x=7$

$6x=1$

$x=\frac{1}{6}$

83.) $\frac{2x+1}{2}=\frac{7x+5}{8}\ /8$

$4(2x+1)=7x+5$

$8x+4=7x+5$

$x=1$

84.) $\frac{x}{2}+\frac{x}{7}=7\ /14$

$7x+2x=98$

$9x=98$

$x=\frac{98}{9}$

85.) $\frac{x}{2}-\frac{x}{3}=5\ /6$

$3x-2x=30$

$x=30$

86.) $\frac{x}{3}-4=\frac{3-x}{6}\ /6$

$2x-24=3-x$

$3x=27\ ;\ x=9$

87.) $\frac{x}{a}-\frac{x}{3a}=b\ /3a$

$3x-x=3ab$

$2x=3ab$

$x=\frac{3ab}{2}$

88.) $\frac{x}{m} - n = x/m$

$x - mn = mx$

$x - mx = mn$

$x(1-m) = mn$

$x = \frac{mn}{1-m}$

89.) $\frac{x-a}{b} = \frac{x-b}{a} \quad /ab$

$ax - a^2 = bx - b^2$

$ax - bx = a^2 - b^2$

$x(a-b) = a^2 - b^2$

$x = a + b$

90.) $\frac{2x-m}{2} = \frac{2x-2}{m} \quad /2m$

$2mx - m^2 = 4x - 4$

$2mx - 4x = m^2 - 4$

$2x(m-2) = m^2 - 4$

$2x = m + 2$

$x = \frac{m+2}{2}$

91.) $21 - \frac{7x+3}{4} = 15/4$

$84 - 7x - 3 = 60$

$7x = 21$

$x = 3$

92.) $2 - \frac{x-3}{4} = \frac{x}{7} \quad /28$

$56 - 7x + 21 = 4x$

$11x = 77$

$x = 7$

93.) $\frac{x-3}{2} - \frac{2x-3}{6} = 1/6$

$3x - 9 - 2x + 3 = 6$

$x = 12$

94.) $3 - \frac{x-2}{3} = \frac{4x+7}{5} \quad /15$

$45 - 5x + 10 = (4x+7)3$

$17x = 34$

$x = 2$

95.) $\frac{x+1}{5} + 3 = \frac{2x-3}{3} \quad /15$

$3x + 3 + 45 = 10x - 15$

$7x = 63$

$x = 9$

96.) $x - \frac{4-x}{3} = \frac{1-x}{2} \quad /6$

$6x - 8 + 2x = 3 - 3x$

$11x = 11$

$x = 1$

97.) $\frac{x}{2} + \frac{x}{3} - \frac{x}{4} = \frac{1}{2} \quad /12$

$6x + 4x - 3x = 6$

$7x = 6$

$x = \frac{6}{7}$

98.) $x - 7 = \frac{x}{5} + \frac{x}{3} \quad /15$

$15x - 105 = 3x + 5x$

$7x = 105$

$x = 15$

99.) $x + \frac{3x-5}{2} = 12 - \frac{2x-4}{3} \quad /6$

$6x + 9x - 15 = 72 - 4x + 8$

$19x = 95$

$x = 5$

100.) $\frac{5y-3}{7} + \frac{13-y}{7} = y - 7 \quad /7$

$5y - 3 + 13 - y = 7y - 49$

$3y = 59 \; ; \; y = \frac{59}{3}$

101.) $\frac{2x-7}{6} + \frac{43x}{7} = 2\frac{1}{7} - \frac{x}{7} \quad /42$

$14x - 49 + 258x = 90 - 6x$

$278x = 139$

$x = \frac{1}{2}$

102.) $\frac{5y-1}{2} - 6\frac{3}{5} = \frac{7y-2}{10} - \frac{y}{2} \quad /10$

$25y - 5 - 66 = 7y - 2 - 5y$

$23y = 69$

$y = 3$

103.) $\frac{3z+7}{14} - \frac{2-z}{6} = \frac{z-7}{21} \quad /42$

$9z + 21 - 14 + 7z = 2z - 14$

$14z = -21$

$z = -\frac{3}{2}$

104.) $29 - \frac{35-7x}{7} = 83 - \frac{5x+29}{8}$

$\frac{5x+29}{8} - \frac{35-7x}{7} = 54$

$\frac{5x+29}{8} - 5 + x = 54$

$\frac{5x+29}{8} + x = 59 \quad /8$

$5x + 29 + 8x = 472$

$13x = 443$

$x = \frac{443}{13} = 34\frac{1}{13}$

105.) $\frac{x}{3}+5+\frac{x+3}{5}=x-5+\frac{x}{4}+\frac{x-2}{5}$

$\frac{x}{3}+\frac{x+3}{5}-\frac{x-2}{5}-x-\frac{x}{4}=-10$

$\frac{x}{3}-x-\frac{x}{4}+\frac{x+3-x+2}{5}=-10$

$\frac{x-3x}{3}-\frac{x}{4}+1=-10$

$-\frac{2x}{3}-\frac{x}{4}=-11 \;/(-12)$

$8x+3x=132$

$11x=132 \;;\; x=12$

106.) $\frac{x}{2}-3+\frac{x}{6}+x=\frac{x-3}{3}+\frac{x-5}{7}+13$

$\frac{x}{2}+\frac{x}{6}+x-\frac{x-3}{3}-\frac{x-5}{7}=13+3=16 \;/42$

$21x+7x+42x-14x+42-6x+30=672$

$64x=614$

$x=\frac{307}{32}$

107.) $\frac{x-1}{2}+\frac{x+4}{3}+2x-5=\frac{5x-7}{2}+\frac{x+5}{5} \;/30$

$15x-15+10x+40+60x-150=75x-105+6x+30$

$15x+10x+60x-75x-6x=-105+30+150-40+15$

$4x=50 \;;\; x=\frac{25}{2}$

108.) $\frac{x}{3a}+a-b=\frac{2x}{a}-4a-\frac{bx}{3a^2}$

$\frac{x}{3a}-\frac{2x}{a}+\frac{bx}{3a^2}=-4a-a+b=-5a+b \;/3a^2$

$ax-6ax+bx=-15a^3+3a^2b$

$bx-5ax=3a^2(b-5a)$

$x(b-5a)=3a^2(b-5a) \quad x=3a^2$

109.) $\frac{x}{m}-\frac{x}{n}=3n-3m$

$\frac{nx-mx}{mn}=3n-3m$

$\frac{x(n-m)}{mn}=3(n-m)$

$x=3mn$

110.) $\frac{x}{a^2}-a^2=b^2-\frac{x}{b^2}$

$\frac{x}{a^2}+\frac{x}{b^2}=a^2+b^2$

$\frac{b^2x+a^2x}{a^2b^2}=a^2+b^2$

$\frac{x(a^2+b^2)}{a^2b^2}=a^2+b^2$

$x=a^2b^2$

111.) $\frac{x+7}{x}=2$

$x+7=2x$

$x=7$

112.) $\frac{2x-1}{x-4}=3$

$2x-1=3x-12$

$x=11$

113.) $\frac{x-5}{x}=\frac{1}{2}$

$2x-10=x$

$x=10$

114.) $\frac{7}{x}=\frac{13}{x+2}$

$7x+14=13x$

$6x=14 \;;\; x=\frac{7}{3}$

115.) $\frac{7}{x}+1=\frac{4-3x}{2x}$

$\frac{7+x}{x}=\frac{4-3x}{2x}$

$7+x=\frac{4-3x}{2}$

$14x+2x=4-3x$

$5x=-10$

$x=-2$

116.) $\frac{7}{x}-\frac{3}{4}=2-\frac{4}{x} \;/4x$

$28-3x=8x-16$

$11x=44$

$x=4$

117.) $\frac{1}{2x}-\frac{4}{3}+\frac{2}{5x}=\frac{1}{6} \;/30x$

$15-40x+12=5x$

$45x=27$

$5x=3 \;;\; x=\frac{3}{5}$

118.) $\frac{3x+5}{x+15}=\frac{7}{5}$

$5(3x+5)=7(x+15)$

$15x+25=7x+105$

$8x=80 \;;\; x=10$

119.) $\frac{5x-7}{2x+7}=1\frac{1}{3}$

$\frac{5x-7}{2x+7}=\frac{4}{3}$

$15x-21=8x+28$

$7x=49 \;;\; x=7$

120.) $\frac{10}{x}=\frac{24}{x+7}$

$10x+70=24x$

$14x=70$

$x=5$

121.) $\frac{9}{x-8}=\frac{21}{x-4}$

$\frac{3}{x-8}=\frac{7}{x-4}$

$3x-12=7x-56$

$4x=44 \;;\; x=11$

122.) $\frac{7}{24-x}=\frac{5}{x-12}$

$7x-84=120-5x$

$12x=204$

$x=17$

123.) $\frac{11}{x-7} = \frac{9}{2x-1}$

$22x-11 = 9x-63$

$13x = -52$

$x = -4$

124.) $\frac{-3}{x+17} = \frac{7}{x+17}$

Jednadžba vrijedi samo, ako je $x+17=0$; $x=-17$

125.) $\frac{5}{x-2} = \frac{2}{x-5}$

$5x-25 = 2x-4$

$3x = 21$

$x = 7$

126.) $\frac{5x+3}{x-1} + \frac{x-3}{2x-2} = 6 \,/\, 2(x-1)$

$10x+6+x-3 = 12x-12$

$x = 15$

127.) $\frac{2x}{x-4} + \frac{2x-5}{x-3} = 4 \,/\, (x-4)(x-3)$

$2x^2-6x+2x^2-8x-5x+20 = 4x^2-28x+48$

$9x = 28$; $x = \frac{28}{9}$

128.) $\frac{x}{x+1} - \frac{3x}{x+2} = -2 \,/\, (x+1)(x+2)$

$x^2+2x-3x^2-3x = -2x^2-6x-4$

$5x = -4$; $x = -\frac{4}{5}$

129.) $\frac{3}{x} - \frac{2}{x+1} = \frac{5}{4(x+1)} \,/\, 4x(x+1)$

$3 \cdot 4(x+1) - 2 \cdot 4x = 5x$

$12x+12-8x = 5x \qquad x = 12$

130.) $(x-2)(x-1) = (x-4)(x+4)$

$x^2-3x+2 = x^2-16$

$3x = 18$; $x = 6$

131.) $(2x+3)(x-5) = (x-3)(2x-4)$

$2x^2-7x-15 = 2x^2-10x+12$

$3x = 27$; $x = 9$

132.) $(5x+2)^2 = (3x-1)^2 + (4x+3)^2$

$25x^2+20x+4 = 9x^2-6x+1+16x^2+24x+9$

$2x = 6$; $x = 3$

133.) $(17x-3)^2 - (8x+4)^2 = (15x+1)^2$

$289x^2-102x+9-64x^2-64x-16 = 225x^2+30x+1$

$196x = -8$; $x = -\frac{49}{2}$

134.) $(13x-2)^2-(12x-24)^2 = (3x+19)^2+(4x+9)^2$

$169x^2-52x+4-144x^2+576x-576 = 9x^2+114x+361+$

$+16x^2+72x+81$

$338x = 1014$; $x = 3$

135.) $\frac{x+3}{x-5} = \frac{x+6}{x-4} \,/\, (x-5)(x-4)$

$x^2-x-12 = x^2+x-30$

$2x = 18$; $x = 9$

136.) $\frac{x+9}{x-6} = \frac{x+17}{x-4} \,/\, (x-6)(x-4)$

$x^2+5x-36 = x^2+11x-102$

$6x = 66$; $x = 11$

137.) $\frac{3x+5}{x-1} = \frac{3(2x+7)}{2x-1} \,/\, (x-1)(2x-1)$

$6x^2+7x-5 = 6x^2+15x-21$

$8x = 16$; $x = 2$

138.) $x : 2\frac{1}{3} = 15 : 7$

$x : \frac{7}{3} = 15 : 7$

$x : 1 = 15 : 3$

$x = 5$

139.) $2{,}5 : 4 = x : \frac{2}{5}$

$25 : 40 = x : \frac{2}{5}$

$1 : 8 = x : 2$

$x = \frac{1}{4}$

140.) $3x : (4x-1) = 4 : 5$

$15x = 16x-4$

$x = 4$

141.) $(7x-3) : (3x-2) = 5 : 2$

$5(3x-2) = 2(7x-3)$

$15x-10 = 14x-6$

$x = 4$

142.) $(3x-16) : 1 = (4x-3) : 5$

$4x-3 = 15x-80$

$11x = 77$

$x = 7$

143.) $(x+5) : 7 = (x-5) : 5$

$7x-35 = 5x+25$

$2x = 60$

$x = 30$

144.) $(5x+1) : (3x+2) = 3 : 2$

$9x+6 = 10x+2$

$x = 4$

145.) $(x+7):(2x+3)=(x-1):(2x-9)$

$(x-1)(2x+3)=(2x-9)(x+7)$

$2x^2+x-3=2x^2+5x-63$

$4x=60\ ;\ x=15$

146.) $(x+0{,}75):x=(x+\frac{1}{4}):(x-0{,}25)$

$x(x+0{,}25)=(x-0{,}25)(x+0{,}75)$

$x^2+0{,}25x=x^2+0{,}50x-0{,}1875$

$0{,}25x=0{,}1875\ ;\ x=0{,}75$

147.) $(x-a):(x-a+5)=(x-5):(x+5)$

$(x-a)(x+5)=(x-a+5)(x-5)$

$x^2-ax+5x-5a=x^2-ax+5x-5x+5a-25$

$15x=10a-25\ ;\ x=\frac{2a-5}{3}$

148.) $\frac{35+8x}{3x}-4=\frac{31-5x}{4x}\ /12x$

$140+32x-48x=93-15x$

$x=47$

149.) $\frac{12x+5}{4}+\frac{8x-3}{5x+2}=\frac{9x+7}{3}\ /12(5x+2)$

$3(5x+2)(12x+5)+12(8x-3)=4(5x+2)(9x+7)$

$3(60x^2+49x+10)+96x-36=4(45x^2+53x+14)$

$180x^2+147x+30+96x-36=180x^2+212x+56$

$31x=62\ ;\ x=2$

150.) $\frac{3x+1}{2x-1}-\frac{3x-1}{2x+1}=\frac{4x-25}{4x^2-1}\ /(4x^2-1)$

$(3x+1)(2x+1)-(3x-1)(2x+1)=4x-25$

$6x^2+5x+1-6x^2+5x-1=4x-25$

$6x=-25\ ;\ x=-\frac{25}{6}$

151.) $\frac{11x+8}{x+3}-\frac{62}{x^2-9}=\frac{11x+6}{x-3}\ /(x^2-9)$

$(11x+8)(x-3)-62=(11x+6)(x+3)$

$11x^2-25x-24-62=11x^2+39x+18$

$64x=-104\ ;\ x=-\frac{13}{8}$

152.) $7(\frac{x}{x+2}-1)=8(\frac{x}{x+1}-1)$

$\frac{7[x-(x+2)]}{x+2}=\frac{8[x-(x+1)]}{x+1}$

$\frac{-14}{x+2}=\frac{-8}{x+1}$

$7(x+1)=4(x+2)$

$7x+7=4x+8$

$3x=1\ ;\ x=\frac{1}{3}$

153.) $4(\frac{2z-7}{3}-2)=6(\frac{z+1}{3}-2)$

$\frac{2[(2z-7)-6]}{3}=\frac{3(z+1-6)}{3}\ /3$

$4z-26=3z-15$

$z=11$

154.) $8(5+3x)+\frac{3(5+3x)}{11}-80=\frac{5+3x}{2}+\frac{11}{2}$

$8u+\frac{3u}{11}-80=\frac{u}{2}+\frac{11}{2}\ /22$

$176u+6u-1760=11u+121$

$171u=1881\ ;\ u=11$

Dakle je $5+3x=11\ ;\ x=2$

155.) $4(x+3)-3(x+3)-2(x+3)+4=0$

$-(x+3)+4=0$

$x+3=4\ ;\ x=1$

156.) $2-\frac{5+x}{7}=1-\frac{9-x}{14}\ /14$

$28-10-2x=14-9+x$

$3x=13\ ;\ x=\frac{13}{3}$

157.) $3=12-\frac{47-\frac{60}{x}}{3}\ /3$

$9=36-47+\frac{60}{x}$

$\frac{60}{x}=20\ ;\ x=3$

158.) $12-\frac{67-\frac{60}{z}}{4}=4\ /4$

$48-67+\frac{60}{z}=16$

$\frac{60}{z}=35\ ;\ z=\frac{12}{7}$

159.) $3-\left(\frac{4+y}{3}-\frac{6+y}{7}\right)=\frac{8+y}{9}-10 \mid 63$

$189-21(4+y)+9(6+y)=7(8+y)-630$

$189-84-21y+54+9y=56+7y-630$

$19y=733;\ y=\frac{733}{19}$

160.) $\frac{a}{bx}+\frac{b}{ax}=a^2+b^2 \mid abx$

$a^2+b^2=abx(a^2+b^2)$

$abx=1;\ x=\frac{1}{ab}$

161.) $\frac{a}{x}=\frac{b}{b+x} \mid x(b+x)$

$ab+ax=bx$

$x(b-a)=ab\ ;\ x=\frac{ab}{b-a}$

162.) $(a-x)(b-x)=x^2$

$ab-bx-ax+x^2=x^2$

$ax+bx=ab$

$x(a+b)=ab;\ x=\frac{ab}{a+b}$

163.) $\frac{a-y}{2b-y}=\frac{2a+y}{b+y} \mid (2b-y)(b+y)$

$ab-by+ay-y^2=4ab-2ay+2by-y^2$

$3ay-3by=3ab$

$y=\frac{ab}{a-b}$

164.) $\frac{2x-1}{3}-\frac{5x-4}{6}-\frac{3x-2}{4}=-\frac{6+7x}{12} \mid 12$

$8x-4-10x+8-9x+6=-6-7x$

$-4x=-16;\ x=4$

165.) $\sqrt{x+8}=7$ / kvadriraj!

$x+8=49$

$x=41$

166.) $2\sqrt{x}-3=3$

$2\sqrt{x}=6$

$\sqrt{x}=3;\ x=9$

167.) $\sqrt{3+9x^2}=2-3x$

$3+9x^2=4-12x+9x^2$

$12x=1;\ x=\frac{1}{12}$

168.) $5=3\sqrt{x}-5$

$100=9x$

$x=\frac{100}{9}$

169.) $\sqrt{36+x}=18+\sqrt{x}$

$36+x=324+36\sqrt{x}+x$

$36\sqrt{x}=-288$

$\sqrt{x}=-8;\ x=64$

170.) $\sqrt{4x^2-7x-6}=9-2x$

$4x^2-7x-6=81-36x+4x^2$

$29x=87$

$x=3$

171.) $\sqrt{x+12}=4\sqrt{x-3}$

$x+12=16x-48$

$15x=60$

$x=4$

172.) $\sqrt{\frac{2x+3}{3x-4}}=\frac{1}{2}$

$\frac{2x+3}{3x-4}=\frac{1}{4}$

$8x+12=3x-4$

$5x=-16$

$x=-\frac{16}{5}$

173.) $\sqrt[3]{5x-7}=2\sqrt[3]{x+1}$

$5x-7=8(x+1)$

$5x-7=8x+8$

$3x=-15$

$x=-5$

174.) $\frac{\sqrt{x}}{6}-\frac{\sqrt{x}}{4}=\frac{\sqrt{x}-17}{12}-\frac{5}{4} \mid 12$

$2\sqrt{x}-3\sqrt{x}=\sqrt{x}-17-15$

$2\sqrt{x}=32$

$\sqrt{x}=16;\ x=256$

175.) $2\sqrt{3x}+\frac{3\sqrt{3x}+5}{2}=5+\frac{10\sqrt{3x}-8}{2} \mid 2$

$4\sqrt{3x}+3\sqrt{3x}+5=10+10\sqrt{3x}-8$

$3\sqrt{3x}=3$

$\sqrt{3x}=1;\ x=\frac{1}{3}$

176.) Umetni za x zadano vrijednost, pa prijeđi jednadžbu po a.

$\frac{2x-a}{x-4}=3$

$\frac{2x-a}{11-4}=3$

$22-a=21$

$a=1$

177.) $\frac{x-a}{x}=\frac{1}{2}$ / vidi zad. 176

$\frac{6-a}{6}=\frac{1}{2}$

$12+2a=6$

$2a=6;\ a=3$

178.) $\frac{x-2a}{x+2a} + \frac{x-4a}{x-3a} = 2$ Vidi zad 176

$(x-2a)(x-3a) + (x-4a)(x+2a) = 2(x+2a)(x-3a)$

$x^2 - 5ax + 6a^2 + x^2 - 2ax - 8a^2 = 2x^2 - 2ax - 12a^2$

$5ax = 10a^2$

$x = 2a$; Ako je $x = 1$, onda je $a = \frac{1}{2}$

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§. 70. Algebarski zadaci.

1.) $x + 15 = 24$

$x = 9$

2.) $x - \frac{x}{3} = 16$

$2x = 48$

$x = 24$

3.) $\frac{x}{5} + 6 = \frac{x}{4}$

$x = 120$

4.) $\frac{7}{x} = 5$

$x = \frac{7}{5}$

5.) $\frac{x}{a+1} = a^2 - a + 1$

$x = (a^2 - a + 1)(a+1)$

$x = a^3 + 1$

6.) $x - 26 = \frac{x}{3}$

$\frac{2x}{3} = 26$

$x = 39$

7.) $(x-3)3 = \frac{x+3}{3}$

$9x - 27 = x + 3$

$x = \frac{15}{4}$

8.) $\frac{x-3}{9} = 6$

$x = 45$

9.) $x - \frac{x}{10} = \frac{x}{2} + 28$

$10x - x = 5x + 280$

$x = 70$

10.) A ima $3x$ a ako B ima x

$3x + x = 734$

$x = 183\frac{1}{2}$

A ima $550\frac{1}{2}$

11.) $2x + 30 = 300$

$x = 135$

12.) Sada ima x g

$\frac{x+20}{2} = x - 5$

$x + 20 = 2x - 10$

$x = 30$

13.) Ako sin ima sada x g ima otac $3x$ g

Prije 12 g otac $(3x-12)$ g a sin $(x-12)$ g

$3x - 12 = 9(x-12)$, $x = 16$ g

14.) $\frac{224}{2x} + 28 = \frac{224}{x}$

$224 + 56x = 448$

$x = 4$ osobe

15.) $\frac{58-x}{14} = 32 - x$

$58 - x = 448 - 14x$

$13x = 390$; $x = 30$ g

16.) Ako B pada ima x g ima A $2x$ g

Prije 7 g imao je B $(x-7)$ g a A $(2x-7)$

$(x-7) + (2x-7) = 2x$

$3x - 14 = 2x$

$x = 14$ g ima B, a A 28 g

17.) Ivjeta ima x, mati $(x+25)$ a otac $(x+30)$ g

$x + (x+25) + (x+30) = 91$

$3x + 55 = 91$

$x = 12$ godina ima Ivjeta, mati 37, a otac 42.

18.) Izletnika je bilo x

$8x = 7(x+4)$

$8x = 7x + 28$

$x = 28$

19.) Dan ima x sati, a noć $(x+13)$ sati.

$x + x + 13 = 24$

$x = 5\frac{1}{2}$ h

20.) Jabuka je bilo x, a kruškaka $120 - x$

Za jabuke je dobila $\frac{x}{7} \cdot 20$, a za kruške $\frac{120-x}{5} \cdot 18$

$\frac{x}{7} \cdot 20 + \frac{120-x}{5} \cdot 18 = 380$

$100x + (840 - 7x)18 = 13300$

$26x = 1820$

$x = 70$ jabuka ; kruškaka je bilo $120 - 70 = 50$

21.) Jedan radnik zaslužuje x K

$8x - 20 = 6x$

$x = 10$ K

22.) Žena je bilo x, a muški 3x. Kad ode 8 osoba ima (x-4) žena i 4(x-4) muškaraca.

$$x+3x-8=x-4+4(x-4)$$
$$4x-8=5x-20$$
$$x=12 \text{ žena}, 36 \text{ muški}.$$

23.) $\frac{3-x}{4-x}=\frac{2}{5}$

$$15-5x=8-2x$$
$$x=\frac{7}{3}$$

24.) Dvoznamenkasti je broj $10x+(10-x)$; jedna je znamenka x, a druga $(10-x)$

$$[10x+(10-x)]2-1=10(10-x)+x$$
$$18x+19=100-9x$$
$$x=3\ ;\ 10-x=7$$

Traženi je broj 37

25.) To je broj $20x+x=84$

$$20x+x+10x+2x=132$$
$$33x=132$$
$$x=4$$

26.) $300+10x+8+270=100x+38$

$$90x=540\ ;\ x=6$$

27.) To je broj $x=213.7+1=1492$

28.) Pogledaj uputu u knjizi.

$$10x+2=3(200000+x)$$
$$7x=599998$$
$$x=85714.$$

Traženi je broj 857142

29.) 1 jabuka stoji x h. 24 jabuke stoje 24x h

On ima dakle $(24x+15)$ h ili $(30x-21)$ h

$$24x+15=30x-21$$
$$x=6 \text{ h stoji 1 jabuka}$$

A ima $24.6+15=159 \text{ h}=1.59 \text{ k}$

30.) Jedan šegrt dobivao x

"pomoćnik" 3x

$$5.3x+8x=27.60$$

x = 120 k dobije svaki šegrt, a 360 svaki pomoćnik

31.) Dobrih je zadaća bilo x. Sin je dobio za njih 20.x h. Loših je bilo 20-x

Morao je dakle otac platiti (20-x)20 h.

$$20x-(20-x)20=160$$
$$20x-400+20x=160$$
$$x=14 \text{ dobrih zadaća}.$$

32.) Radio je x dana i dobio za njih 3x k. Nije radio (60-x) dana i platio gospodaru (60-x).1 k.

$$3x-(60-x)=48$$
$$x=27 \text{ dana je radio}$$

33.) Druga ima x, a prva $\frac{3}{4}x$

$$x+\frac{3}{4}x=14 \text{ l}$$
$$x=8 \text{ l ima druga posuda}.$$

Prva ima $\frac{3}{4}.8=6 \text{ l}$.

34.) Ako brat ima x braće ima sestra (x+1) brata. Ako sestra ima y sestara ima brat (y+1) sestru.

$$y=\frac{x+1}{2}$$
$$x=y+1 \text{ ili } y=x-1$$
$$2y=x+1$$
$$2(x-1)=x+1$$
$$x=3$$

Bile su 3 djevojčice i 4 dječaka.

35.) Sastati će se iza x sati. Prva osoba prevali za to vrijeme $\frac{21}{2}x$ km, a druga $\frac{35}{4}x$ km

$$\frac{21}{2}x + \frac{35}{4}x = 1078\,km$$

$$x = 56 \text{ sati}$$

Prva će osoba prevaliti put od $\frac{21}{2} \cdot 56 = 588$ km

36.) Sastati će se iza x sati odkako je brži vlak pošao iz A. Brzi je vlak za to vrijeme prevalio $3\frac{1}{2}x$ puta između A i B. Osobni vlak ide 1 sat manje t.j: $(x-1)$ sati i prevali za to vrijeme $5\frac{1}{4}(x-1)$ puta između A i B. Suma tih puteva = je cio put = 1

$$\frac{x}{3\frac{1}{2}} + \frac{x-1}{5\frac{1}{4}} = 1\,; \quad x = 2 \cdot 5^h$$

Sastanu se u $8\frac{1}{2}$ sati.

37.) Sastati će se iza x minuta iza kako je pošao prvi pješak. Prvi će pješak za to vrijeme prevaliti put od $60.x$ m. Drugi pješak ide 10 minuta manje i prevali za to vrijeme $(x-10)75$ m.

$$60x = (x-10)75$$

$x = 50$ minuta iza kako je pošao prvi pješak.

Udaljenost = $50.60 = 3000$ m $= 3$ Km.

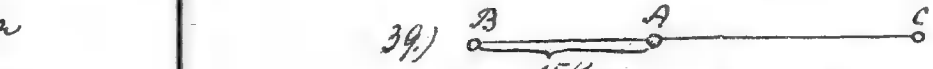
38.) Konjanik će stići pješaka x sati iza kako je pješak pošao. Konjanik je trebao da ga stigne $(x-7)$ sati.

$$x : (x-7) = 12 : 5$$

$$x = 12$$

Konjanik će dakle jahati $12-7 = 5^h$ do dostignuća pješaka

39.)



A će prevaliti do mjesta C gdje će ga B dostići $15 - 6 = 90$ km (Od 5^h u jutro do 8^h na veče ima 15^h) B ima da prevali do C $90 + 15 = 105$ km i to mora da prevali za 15 sati. Za 1 sat mora da prevali x km.

$$15x = 135\,; \quad x = 7 \text{ km na sat.}$$

40.) Brzina velike kazaljke odnosi se prema brzini male kazaljke kao 12:1 Ako mala kazaljka prevali x minuta prevali velika da se pokriju $(60+x)$ minuta.

$$(60+x) : x = 12 : 1$$

$$x = \frac{60}{11} = 5\frac{5}{11} \text{ min.}$$

Minuta je tu uzeta kao put t.j: 60 ti dio kruga. Kazaljke će se dakle pokrivati u $1\frac{5}{11}{}^h$ iza podne, jer mala kazaljka prevali 5 min. puta za 1^h

41.) Mala kazaljka stoji x minuta puta (Vidi zad 40) dalje od 3^h. Velika kazaljka stoji $x+15$ minuta puta dalje od 3^h.

$$(x+15) : x = 12 : 1$$

$$x = \frac{15}{11} = 1\frac{4}{11} \text{ min. puta}$$

Velika kazaljka stoji $15 + 1\frac{4}{11} = 16\frac{4}{11}$ minuta puta dalje od 3^h, pokazuje dakle $3^h + 15 + 16\frac{4}{11} = 3^h$ i $31\frac{4}{11}$ min.

42.) $120^\circ = \frac{1}{3}$ kruga $= 20$ min puta.

Mala kazaljka prevali x minuta puta (Vidi zad. 40) će 9^h, a velika $x+20$ min. puta. $(x+20) : x = 12 : 1$

$$x = \frac{20}{11} = 1\frac{9}{11} \text{ min. puta.}$$

(Nastavak na drugoj strani)

43.) Kroz obe cijevi napuni se za $1^h \frac{1}{12}$ posude. Kroz jednu cijev napuni se za $1^h \frac{1}{20}$ posude. Kroz drugu se napuni dakle za $1^h \frac{1}{12} - \frac{1}{20} = \frac{1}{30}$ posude. Druga cijev treba potome 30 sati da napuni posudu.

44.) Kroz 1 cijev ispusti se za $1^h \frac{1}{5}$ posude, a kroz drugu isprazni $\frac{1}{6}$ posude. U posudi ostane iza jednog sata $\frac{1}{5} - \frac{1}{6} = \frac{1}{30}$ posude pune vode. Posuda će biti puna za 30 sati.

45.) Kroz cijev A uteče za $1^h \frac{1}{3}$ posude, a kroz cijev B $\frac{1}{6}$ posude. Iza 1 sata ima $\frac{1}{3} + \frac{1}{6} = \frac{1}{2}$ posude pune vode. Za 1 sat isteče kroz cijev C $\frac{1}{7}$ posude. Iza jednog sata ima u istini $\frac{1}{2} - \frac{1}{7} = \frac{5}{14}$ posude pune vode. Posuda će biti puna iza $\frac{14}{5} = 2\frac{4}{5}$ sata.

46.) Ako obojica zajedno trebaju x dana da obave posao, to popše za 1 dan $\frac{1}{x}$ posla. A popši za 1 dan $\frac{1}{8}$ posla, a B $\frac{1}{10}$ posla.

$$\frac{1}{x} = \frac{1}{8} + \frac{1}{10}$$

$x = 4\frac{4}{9}$ dana.

47.) A popši za 1 dan $\frac{1}{12}$ posla. Ako B sam treba x dana, to popši za 1 dan $\frac{1}{x}$ posla. Obojica zajedno popše za 1 dan $\frac{1}{4}$ posla.

$\frac{1}{12} + \frac{1}{x} = \frac{1}{4}$; $x = 6$ dana treba B.

B je bolji radnik.

48.) Platio je x K

$x + \frac{8x}{100} = 1{\cdot}35$

$x = 1{\cdot}25$ K platio

49.) Trgovca stoji 1 kg x h

$x - \frac{12x}{100} = 66$

$x = 75$ h

je trgovac za 1 kg

50.) Zadatak je neosnovan.

51.) x l po 96 h, a $(160-x)$ l po 128 h

$96x + (160-x)\,128 = 160 \cdot 108$

52.) Treba dodati x litara vode po 80 h

$25 \cdot 32 + x \cdot 80 = (25+x) \cdot 70$

53.) Izvedi jednadžbu na temelju računa prijese.

54.) Vidi zad. 53.

55.) Prije je dobivao svaki radnik 3 K na dan. Ako sada dobiva svaki od x radnika 4 K na dan, a gospodar isplaćuje dnevno 240 K, to je $4x = 240$, a $x = 60$ radnika je ostalo. Otpušteno ih je 20.

56.) Gospodar će oduzeti sluzi $\frac{5}{12}$ prijednosti odbijele od $\frac{7}{12}$ njegove godišnje zaslužbe, ja odlazi 5 mjeseci prije kraja godine.

$\frac{160 \cdot 7}{12} - \frac{5x}{12} = 42{\cdot}80$; $x = 121{\cdot}48$ K je računano za odbijelo.

57.) Prije je bilo x radnika od kojih je svaki dobivao a K. Dnevni izdatak iznosio je ax K. Kad je otpušteno 140 radnika, dobiva svaki $a - \frac{15a}{100}$, a dnevni izdaci iznose $(x-140)(a - \frac{15a}{100}) =$

$= (x-140)\,a\left(1-\frac{15}{100}\right)K$. Tipu jednaki polovici prijašnjih izdataka.

$$\frac{ax}{2} = (x-140)\cdot a\left(1-\frac{15}{100}\right)$$

$$\frac{x}{2} = (x-140)\,\frac{100-15}{100}$$

$x = 340$ radnika je prije bilo.

58.) Imutak $= x\,K$

$$\frac{3}{4}x\cdot 5 + \frac{1}{4}x\cdot 4\frac{1}{2} = 1170$$

$$\frac{15x}{4} + \frac{9x}{8} = 117000$$

$x = 24000\,K$

59.) Kamate kroz 20 godina moraju biti jednaki glavnici.

$$\frac{ax}{100}\cdot 20 = a$$

$x = 5\%$

60.) $x + \frac{x\cdot 5{\cdot}75}{100} = 3798{\cdot}54$

$x = 3592$

61.) Prva je glavnica x, druga $(5330-x)$

$$\frac{5x}{100} = 2\,\frac{(5330-x)}{100}\,4$$

$5x = 8(5330-x)$

$x = 3280\,K$ je prva glavnica

Druga je $5330-x = 2050\,K$

62.) Za x godina

$$\frac{4400\cdot 5}{100}x + \frac{5500\cdot 4{\cdot}5}{100}x = 1870$$

$220x + 247{\cdot}5x = 1870$

$467{\cdot}5x = 1870$

$x = 4$ godine

63.) Prva je $(x+2000)$, druga x

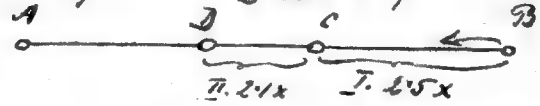
$$\frac{(x+2000)5}{100} = \frac{x\cdot 6}{100}$$

$5x + 10000 = 6x$

$x = 10000$ je druga glavnica.

Prva je $12000\,K$.

64.) Po uputi za zad. 40, 41 i 42.

65.) 

$DB = 40{\cdot}48$

Prvi je ajčak trebao da prevali put od A do B $\frac{253}{2{\cdot}5} = 101{\cdot}2$ sek. Njegov drug prevalio je za to vrijeme $101{\cdot}2\cdot 2{\cdot}1 = 212{\cdot}52$ m, tese nalazi u tački D u istom času, kad prvi djčak počne trčati od B prema njemu. Udaljenost $DB = 253 - 212{\cdot}52 = 40{\cdot}48$ m. Djčaci će se sastati u tački C iza x sek.

$2{\cdot}1x + 2{\cdot}5x = 40{\cdot}48$ Djčaci će se sastati

$4{\cdot}6x = 40{\cdot}48$ iza $101{\cdot}2 + 8{\cdot}8 = 110$ sek

$x = 8{\cdot}8$ sek. iza kako su pošli iz A.

66.) A je imao x, a B $(1416-x)\,K$

$$x - \frac{4}{7}x = 1416 - x - \frac{3}{8}(1416-x)$$

$$\frac{3x}{7} = 1416 - x - 531 + \frac{3}{8}x$$

$$\frac{59x}{56} = 885$$

$x = 840\,K$; B ima $1416-840 = 576\,K$

67.) Ako je prvi dio x, onda je drugi $(x-8)$ a treći $(x-16)$

$x + x - 8 + x - 16 = 60$ Prvi je dio 28

$3x - 24 = 60$ drugi 20, a treći 12.

$x = 28$

68.) Jedan iznosi x, a drugi $180-x$

$x+23°45' = 180°-x$

$x = 78°7'30''$

Drugi: $78°7'30'' + 23°45' = 101°52'30''$

69.) a) $x:(180-x) = 4:5$ Rezultat u knjizi.

b.) $x:(180-x) = 1\frac{1}{2}:\frac{3}{4}$

70.) Prvi iznosi $x°$ drugi $x+12°18'$ a treći $x+12°18'+6°30' = x+18°48'$

$x+x+12°18'+x+18°48' = 180$

Rezultat u knjizi.

71.) Ako je jedan kut na podnici $= x$, onda je kut na vrhu jednak za a.) $2x$ b.) $3x$ c.) $4x$

a.) $x+x+2x = 180$; $x = 45°$; kut na vrhu $= 90°$

b) $x+x+3x = 180$; $x = 36$ " " " $= 108°$

c.) $x+x+4x = 180$; $x = 30$ " " " $= 120°$

slično zaključi ako je kut na vrhu manji.

72.) Izračunaj po formuli $n.180-360 =$ suma prijeđenih kuteva u poligonu.

n označuje broj stranica.

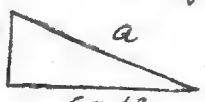
73 i 74. po formulama iz geometrije.

75.) Centrični kut $=$ 2 puta obodni kut.

$x = \frac{x}{2}+24$

$x = 48°$ je centrični kut

76.)



$a+b+c = 30$

$a+b = 30-c = 30-12 = 18$

$b^2 = a^2-12^2$

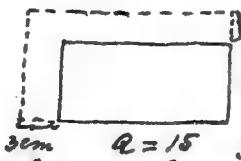
$a+b = 18$

$b = 18-a$

$(18-a)^2 = a^2-12^2$

$a = 13$; $b = 5$

77.)



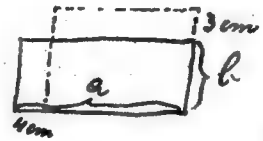
$ax+78 = (a+3)(x+3)$

$15x+78 = 18(x+3)$

$x = 8$

Prijašnja površina pravokutnika $= ax = 15\cdot 8 = 120\ cm^2$

78.)



$2a+2b = 78$

$a+b = 39$

$ab = (a-4)(b+3)$

$ab = ab-4b+3a-12$

$4b = 3a-12$

$b = 39-a$

$b = \frac{3a-12}{4} = 39-a$

$\frac{3a-12}{4} = 39-a$

$7a = 168$

$a = 24$

$b = 15$

79.) Hipotenuza $= x$, druga kateta $= (x-2)$

$x^2 = (x-2)^2+12^2$

$x^2 = x^2-4x+4+144$

$x = 37$

80.) Druga kateta je x

$(x+2)^2 = x^2+8^2$

$x^2+4x+4 = x^2+8^2$

$x = 15$

81.) Podnica je x, krak $(x-11)$

$x+2(x-11) = 53$

$x+2x-22 = 53$

$3x = 75$; $x = 25$; krak $= 14$

82.) Visina na stranicu $a = \frac{2}{a}\sqrt{s(s-a)(s-b)(s-c)}$

" " " $b = \frac{2}{b}\sqrt{s(s-a)(s-b)(s-c)}$

$v_a : v_b = \frac{1}{a}\sqrt{s(s-a)(s-b)(s-c)} : \frac{1}{b}\sqrt{s(s-a)(s-b)(s-c)}$

$v_a : v_c = \frac{1}{a} : \frac{1}{b}$ $v_a = x$

$v_a : v_c = b : a$ $v_c = 27-x$ / Nastavak na drugoj str. /

$x:(27-x)=16:20$

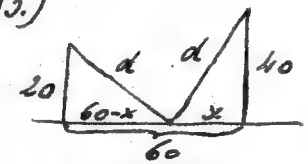
$20x=16(27-x)$

$5x=4(27-x)$

$5x=108-4x$

$9x=108;\ x=12=v_a;\ v_B=15$

83.)



$d=\sqrt{40^2+x^2}$

$d=\sqrt{20^2+(60-x)^2}$

$\sqrt{40^2+x^2}=\sqrt{20^2+(60-x)^2}$

$40^2+x^2=20^2+(60-x)^2$

$1600+x^2=400+3600-120x+x^2$

$120x=4000-1600$

$x=20$

84.) $2r\pi=2r+\frac{\alpha r\pi}{180}$

$2\pi=2+\frac{\alpha\pi}{180}$

$360\pi-360=\alpha\pi$

$\alpha=360\left(1-\frac{1}{\pi}\right)$

Opseg sektora $=2r+l=2r+\frac{\alpha r\pi}{180}$

85.)

$(a+1)(2a+1)=2a\cdot a+16$

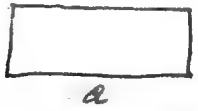
$2a^2+3a+1=2a^2+16$

$3a=15$

$a=5$

$2a=10$

86.)



$2a+2b=64$

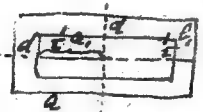
$a+b=32$

$(a-2)(b+4)=ab+66$

$ab-2b+4a-8=ab+66$

$4a-2b=74$

87.)



$2a-b=37$

$a+b=32$ } +

$3a=69$

$a=23;\ b=9$

$2a_1+2b_1=\frac{2a+2b}{2}$

$a_1+b_1=\frac{a+b}{2}=\frac{19+15}{2}=17$

$d=\frac{b}{2}-\frac{b_1}{2}=\frac{a}{2}-\frac{a_1}{2}$ /:Nastavak na drugoj str../

$b-b_1=a-a_1$

$a_1-b_1=a-b=4$

$a_1+b_1=17$ } +

$2a_1=21$

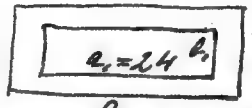
$a_1=10\frac{1}{2};\ b_1=6\frac{1}{2}$

$d=\frac{a}{2}-\frac{a_1}{2}=\frac{b}{2}-\frac{b_1}{2}$

$d=\frac{15}{2}-\frac{13}{4}=\frac{30-13}{4}$

$d=\frac{17}{4}=4\frac{1}{4}$

88.)



Iz zadatka 87. slijedi:

$a_1-b_1=a-b$

$24-b_1=a-18$

$a+b_1=42$

$b_1=\frac{a}{2}$

$a+\frac{a}{2}=42$

$\frac{3a}{2}=42;\ a=28$

$a_1b_1=\frac{2}{3}ab$

$24b_1=\frac{2}{3}\cdot 18a$

$24b_1=12a$

$2b_1=a$

$b_1=\frac{a}{2}$

---

§ 11. Jednadžbe prvog stepena sa više nepoznanica

1.) $x+y=5$

$4x-y=5$

$5x=10$

$x=2;$

Metoda jednakih koeficijenata

$2+y=5$

$y=3$

2.) $3x+2y=21$

$7x-2y=29$

$10x=50$

$x=5$

$15+2y=21$

$2y=6$

$y=3$

M. j. k

3.) $4x-2y=6$ |-1 M. j. k.

$4x+5y=13$

$-4x+2y=-6$

$4x+5y=13$

$7y=7$

$y=1$

$x=2$

4.) $7x+12y=50 \mid 3$ M.j.: k.
$5x+9y=37 \mid -4$

$21x+36y=150$
$-20x-36y=-148$
$x=2$

$14+12y=50$
$12y=36$
$y=3$

5.) $3x+2y=13 \mid 3$ M.j.: k.
$2x+3y=12 \mid -2$

$9x+6y=39$
$-4x-6y=-24$
$5x=15$
$x=3$
$y=2$

6.) $5x+3y=18$ Metoda supstitucije
$3y-y=8$

$2y=8;\ y=4$
$5x+12=18$
$5x=6;\ x=\frac{6}{5}$

7.) $8x+5y=34 \mid -3$ M.j.: k.
$7x+3y=27 \mid 5$

$-24x-15y=-102$
$35x+15y=135$
$11x=33$
$x=3$
$y=2$

8.) $14x+3y=13 \mid 5$ M.j.
$18x-5y=-1 \mid 3$ k.

$70x+15y=65$
$54x-15y=-3$
$124x=62$
$x=\frac{1}{2};\ y=2$

9.) $0{\cdot}8x-2{\cdot}1y=3{\cdot}3 \mid$ M.j: k
$1{\cdot}2x+7y=35{\cdot}4 \mid 0{\cdot}3$

$0{\cdot}8x-2{\cdot}1y=3{\cdot}3$
$0{\cdot}36x+2{\cdot}1y=10{\cdot}62$
$1{\cdot}16x=13{\cdot}92$
$x=12;\ y=3$

10.) $4\frac{1}{2}x+5\frac{1}{3}y=68$
$2\frac{1}{4}x-2\frac{1}{6}y=5$

$\frac{9}{2}x+\frac{16}{3}y=68 \mid 6$
$\frac{9}{4}x-\frac{13}{6}y=5 \mid 12$

$27x+32y=408$
$54x-26y=60 \mid -1$ M.j. k.
$58y=348$
$y=6;\ x=8$

11.) $\frac{y}{3}+1=x \mid 3$
$\frac{2y}{5}=8-\frac{x}{3} \mid 15$

$y+3=3x$
$6y=120-5x$
$-y+3x=+3 \mid 6$
$6y+5x=120$
$-6y+18x=18$
$6y+5x=120$
$23x=138$
$x=6;\ y=15$

12.) $\frac{x}{3}+\frac{y}{5}=3 \mid 15$
$\frac{7x+4}{5y}=1 \mid 5y$

$5x+3y=45 \mid 5$ M.j.
$7x-5y=-4 \mid 3$ k.
$25x+15y=225$
$21x-15y=-12$
$46x=213$
$x=\frac{213}{46};\ y=\frac{335}{46}$

13.) $3x+4y=53$ M.s.
$x:y=7:8$

$y=\frac{8x}{7}$
$3x+4\cdot\frac{8x}{7}=53$
$21x+32x=371$
$53x=371$
$x=7;\ y=8$

14.) $5x:4y=0{\cdot}75\ldots$ I.
$2x:3y=3:7\frac{1}{2}\ldots$ II.

$\frac{5x}{4y}=\frac{3}{4}\ldots$ I.
$5x=3y\ldots$ I.
$9y=15x\ldots$ II.
$5x=3y\ldots$ II.
Jednadžbe nije moguće pojednostaviti, jer su obje jednake.

15.) $(5x-y):(3x+13)=19:25$
$(3x+4y):(7x-8)=4:5$

$125x-25y=57x+247$
$15x+20y=28x-32$
$68x-25y=247 \mid 4$ M.j.
$13x-20y=32 \mid -5$ k.
$272x-100y=988$
$-65x+100y=-160$
$207x=828$
$x=4;\ y=1$

16.) $x:y=3:5\ldots$ I.
$(x+1):(y+3)=7:13\ldots$ II.

$13x+13=7y+21$
$13x-7y=8\ldots$ I.)
$y=\frac{5x}{3}\ldots$ I. M.s.
$13x-7\cdot\frac{5x}{3}=8$
$39x-35x=24$
$4x=24$
$x=6;\ y=10$

17) $(x+1):(y-1)=3:2$
$(x-2):(y+2)=2:3$

$2x+2=3y-3$
$3x-6=2y+4$

$2x-3y=-5 \mid \cdot(-2)$ M.j.
$3x-2y=10 \mid \cdot 3$ k.

$-4x+6y=10$
$9x-6y=30$

$5x=40$
$x=8;\ y=7$

18) $(3x+y):(2x+7)=11:13$
$(5x-3y):(3x-14)=9:-5$

$39x+13y=22x+77$
$-25x+15y=27x-126$

$17x+13y=77 \mid \cdot 15$ M.j.
$52x-15y=126 \mid \cdot 13$ k.

$255x+195y=1155$
$676x-195y=1638$

$931x=2793$
$x=3;\ y=2$

19) $\frac{x+3}{y}=\frac{1}{3}$
$\frac{x}{y-1}=\frac{1}{5}$

$3x+9=y$ M.s.
$5x=y-1$
$5x=3x+9-1$
$2x=8$
$x=4;\ y=21$

20) $\frac{x+y}{3}+x=15$
$\frac{x-y}{5}+y=6$

$4x+y=45 \mid \cdot$ M.s. $\cdots$ I.
$x+4y=30 \mid \cdot \cdots$ II.

$x=30-4y \cdots$ II.
$4(30-4y)+y=45$
$120-16y+y=45$
$15y=75$
$y=5;\ x=10$

21) $\frac{x-2}{5}+\frac{y-1}{8}=2$
$\frac{2x-5}{3}+2y=21$

$8x-16+5y-5=80 \mid \cdot 6$
$2x-5+6y=63 \mid \cdot(-5)$ M.s.k.

$48x+30y=606$
$-10x-30y=-340$

$38x=266$
$x=7;\ y=9$

22) $\frac{x-2}{5}-\frac{10-x}{3}=\frac{y-10}{4}$
$\frac{2y+4}{3}-\frac{2x+y}{8}=\frac{x+13}{4}$

$12x-24-200+20x=15y-150$
$16y+32-6x-3y=6x+78$

$32x-15y=74 \mid \cdot 3$ M.j.
$-12x+13y=46 \mid \cdot 8$ k.

$y=10;\ x=7$

23) $2y-\frac{x-3}{5}=\frac{5y-2}{2}$
$2x-\frac{y-5}{5}=\frac{7x-7}{2}$

$20y-2x+6=25y-10$
$20x-2y+10=35x-35$

$2x+5y=16 \mid \cdot(-2)$ M.j.
$15x+2y=45 \mid \cdot 5$ k.

$-4x-10y=-32$
$75x+10y=225$

$71x=193$
$x=\frac{193}{71}$
$y=\frac{150}{71}$

24) $\frac{3x-5y}{2}+3=\frac{2x+y}{5} \mid \cdot 10$
$8-\frac{x-2y}{4}=\frac{x}{2}+\frac{y}{3} \mid \cdot 12$

$15x-25y+30=4x+2y$
$96-3x+6y=6x+4y$

$11x-27y=-30 \mid \cdot(-9)$ M.j.
$9x-2y=96 \mid \cdot 11$ k.

$-99x+243y=270$
$99x-22y=1056$

$221y=1326$
$y=6;\ x=12$

25) $\frac{3y-x-1}{2}+y-\frac{1}{4}=\frac{3(x-1)}{4} \mid \cdot 4$
$\frac{4y+3x}{5}=\frac{7x}{10}+2 \mid \cdot 10$

$6y-2x-2+4y-1=3x-3$
$8y+6x=7x+20$

$10y-5x=0 \cdots$ I.
$8y-x=20 \cdots$ II.

$x=2y \cdots$ I. M.s.
$8y-2y=20 \cdots$ II.
$6y=20$
$y=\frac{10}{3};\ x=\frac{20}{3}$

26) $3(x+1)-4(y+2)=3 \mid \cdot(-5)$
$7(x+1)-5(y+2)=20 \mid \cdot 4$

$-15(x+1)+20(y+2)=-15$
$28(x+1)-20(y+2)=80$

$13(x+1)=65$
$x+1=5$
$x=4;$

$3(4+1)-4(y+2)=3$
$4(y+2)=12$
$y+2=3$
$y=1$

27.) $7(x-2)+5(y+6)=21 \mid 3$
$4(x-2)-3(y+6)=12 \mid 5$

$21(x-2)+15(y+6)=63$
$20(x-2)-15(y+6)=60$

$41(x-2)=123$
$x-2=3$
$x=5$

$7(5-2)+5(y+6)=21$
$5(y+6)=0$
$y+6=0$
$y=-6$

28.) $\frac{1}{x}+\frac{1}{y}=\frac{5}{6}$ Saberi
$\frac{1}{x}-\frac{1}{y}=\frac{1}{6}$

$\frac{2}{x}=\frac{6}{6}=1$
$x=2$

$\frac{1}{x}+\frac{1}{y}=\frac{5}{6}$
$\frac{1}{x}-\frac{1}{y}=\frac{1}{6} \mid -1$

$\frac{2}{y}=\frac{4}{6}$
$y=3$

29.) $9\frac{1}{x}-4\frac{1}{y}=1 \mid 5$ M.j. k.
$18\frac{1}{x}+20\frac{1}{y}=16$

$45\frac{1}{x}-20\frac{1}{y}=5$
$18\frac{1}{x}+20\frac{1}{y}=16$

$63\frac{1}{x}=21$
$\frac{1}{x}=\frac{1}{3}$
$x=3;\ y=2$

30.) $\frac{12}{x}+\frac{8}{y}=8 \mid 3$ M.j. 2 k.
$\frac{27}{x}-\frac{12}{y}=3$

$\frac{36}{x}+\frac{24}{y}=24$
$\frac{54}{x}-\frac{24}{y}=6$

$\frac{90}{x}=30$
$\frac{1}{x}=\frac{1}{3}$
$x=3;\ y=2$

31.) $\frac{5}{3x}+2y=9 \mid -3$ M.j. k.
$\frac{8}{x}+3y=30 \mid 2$

$-\frac{5}{x}-6y=-27$
$\frac{16}{x}+6y=60$

$\frac{11}{x}=33$
$\frac{1}{x}=3$
$x=\frac{1}{3};\ y=2$

32.) $\frac{8}{x}-\frac{9}{y}=1 \mid 3$ M.j. k.
$\frac{34}{x}+\frac{27}{y}=26$

$\frac{24}{x}-\frac{27}{y}=3$
$\frac{34}{x}+\frac{27}{y}=26$

$\frac{58}{x}=29$
$x=2;\ y=3$

33.) $\frac{1}{3x}+\frac{1}{2y}=\frac{5}{6}$ saberi
$\frac{1}{3x}-\frac{1}{2y}=-\frac{1}{6}$

$\frac{2}{3x}=\frac{4}{6}$
$\frac{1}{x}=\frac{2}{2}=1$
$x=1;\ y=1$

34.) $\frac{2x}{5}-\frac{3}{y}=-\frac{13}{5} \mid 2$ M.j. 3 k.
$x+\frac{2}{y}=3$

$\frac{4x}{5}-\frac{6}{y}=-\frac{26}{5}$
$3x+\frac{6}{y}=9$

$\frac{4x}{5}+\frac{15x}{5}=-\frac{26}{5}+\frac{45}{5}$
$\frac{19x}{5}=\frac{19}{5}$
$x=1;\ y=1$

35.) $\frac{3}{x+1}+\frac{1}{y-2}=2$
$\frac{5}{x+1}-\frac{2}{y-2}=-\frac{1}{3} \mid 2$ M.j. k.

$\frac{6}{x+1}+\frac{2}{y-2}=4$
$\frac{5}{x+1}-\frac{2}{y-2}=-\frac{1}{3}$

$\frac{11}{x+1}=\frac{11}{3}$
$x+1=3$
$x=2;\ y=3$

36.) $3\left(\frac{3}{x}-\frac{2}{y}\right)-2\left(\frac{2}{x}-\frac{1}{y}\right)=15$
$2\left(\frac{1}{x}-\frac{1}{y}\right)-2\left(\frac{2}{x}+\frac{3}{y}\right)=2$

$\frac{9}{x}-\frac{6}{y}-\frac{4}{x}+\frac{2}{y}=15$
$\frac{1}{x}-\frac{1}{y}-\frac{2}{x}-\frac{3}{y}=1$

$\frac{5}{x}-\frac{4}{y}=15$
$-\frac{1}{x}-\frac{4}{y}=1 \mid -1$

$\frac{5}{x}-\frac{4}{y}=15$
$\frac{1}{x}+\frac{4}{y}=-1$

$\frac{6}{x}=14$
$x=\frac{3}{7};\ y=-\frac{6}{5}$

37.) $x+y=16$ .. I. saberi
$x+z=22$ .. II. ove
$y+z=28$ .. III. jednadži.

$2x+2y+2z=66$
$x+y+z=33$
$x+y=16$ .. I. $\mid -1$

$z=17$

$x+y+z=33$
$x+z=22$ .. II. $\mid -1$

$y=11$

$x+y+z=33$
$y+z=28$ .. III. $\mid -1$

$x=5$

38.) $3x+5y=161 \dots I.$
$7x+2z=209 \dots II.$
$2y+z=89 \dots III.$

$3x+5y=161 \mid 7$
$7x+2z=209 \mid -3$ M.j. R.
$21x+35y=1127$
$-21x-6z=-627$
$35y-6z=500$
$2y+z=89 \mid 6$
$35y-6z=500$
$12y+6z=534$
$47y=1034$
$y=22$
$z=89-2y \dots III.$
$z=45$
$x=\frac{161-5y}{3} \dots I.$
$x=17$

39.) $x+2y=23 \dots I.$
$3x+4z=57 \dots II.$
$5y+6z=94 \dots III.$

$x+2y=23 \mid 3$ M.j.
$3x+4z=57 \mid -1$ R.
$3x+6y=69$
$-3x-4z=-57$
$6y-4z=12$
$3y-2z=6$
$5y+6z=94 \dots III. \mid 3$
$9y-6z=18$
$5y+6z=94$
$14y=112$
$y=8$
$x=23-2y \dots I.$
$x=7$
$z=\frac{57-3x}{4} \dots II.$
$z=9$

40.) $x+y+z=14 \dots I.$
$x-y+z=6 \dots II.$
$x+y-z=10 \dots III.$

$x+y+z=14$
$x-y+z=6 \mid -1$
$2y=8 ; y=4$
$x-y+z=6$
$x+y-z=10$
$2x=16$
$x=8$
$z=2$

41.) $x+y-z=5 \dots I.$
$x+2y+z=13$
$2x-y+2z=6$

$x+y-z=5$
$x+2y+z=13$
$2x+3y=18 \mid 1$
$4x+y=16 \mid 3$
$-2x-3y=-18$
$12x+3y=48$
$10x=30$
$x=3$
$y=16-4x \dots 1.)$
$y=4$
$z=x+y-5 \dots I.$
$z=2$

$x+y-z=5 \mid 2$
$2x-y+2z=6$
$2x+2y-2z=10$
$2x-y+2z=6$
$4x+y=16 \dots 1.)$

42.) $x-3y+4z=8 \dots I.$
$x+2y+3z=14$
$3x-4y+5z=10$

$x-3y+4z=8$
$x+2y+3z=14 \mid -1$
$-x+3y-4z=-8$
$x+2y+3z=14$
$5y-z=6 \mid -1$
$5y+2z=16 \dots 1.)$
$3z=10$
$z=\frac{10}{3}$

$x+2y+3z=14 \mid 3$
$3x-4y+5z=10 \mid -1$
$3x+6y+9z=42$
$-3x+4y-5z=-10$
$10y+4z=32$
$5y+2z=16 \dots 1.)$
$y=\frac{16-2z}{5}$
$y=\frac{28}{15}$
$x=8+3y-4z \dots I.$
$x=\frac{4}{15}$

43.) $3x+4y+5z=38$
$x+2y-z=4 \dots II.$
$6x+8y+3z=15$

$3x+4y+5z=38$
$x+2y-z=4 \mid 5$
$3x+4y+5z=38$
$5x+10y-5z=20$
$8x+14y=58$
$9x+14y=27 \mid -1 \dots 1.)$
$-8x-14y=-58$
$9x+14y=27$
$x=-31$

$x+2y-z=4 \mid 3$
$6x+8y+3z=15$
$3x+6y-3z=12$
$6x+8y+3z=15$
$9x+14y=27$
$y=\frac{58-8x}{14} \dots 1.)$
$y=\frac{153}{7}$
$z=x+2y-4 \dots II.$
$z=\frac{61}{7}$

44.) $x+y-2z=6 \dots I.$ M.S
$3x-2z=13 \dots II.$
$3y=5z+4 \dots III.$

$y=\frac{5z+4}{3} \dots III.$
$x+\frac{5z+4}{3}-2z=6 \dots I.$
$3x+5z+4-6z=18$
$3x-z=14$

$3x-z=14 \mid 2$
$3x-2z=13 \mid -1$
$6x-2z=28 \dots 1.)$
$-3x+2z=-13$
$3x=15 ; x=5$
$z=\frac{6x-28}{2} \dots 1.) ; z=1$
$y=\frac{5z+4}{3} \dots III. ; y=3$

45.) $\frac{x+y}{3}+2z=21 \dots I.$

$\frac{3x}{2}-\frac{z-y}{2}=38 \dots II.$

$3x-\frac{y+z}{2}=65 \dots III.$

$x+y+6z=63 \dots 2.)$

$3x-z+y=76$

$6x-y-z=13$ } +

$9x-2z=206$ | 5

$7x+5z=193$ | 2

$45x-70z=1030$

$14x+10z=386$

$59x=1416$

$x=24$

$x+y+6z=63$

$6x-y-z=130$ } +

$7x+5z=193 \dots 1.)$

$z=\frac{193-7x}{5} \dots 1.)$

$z=5$

$y=63-x-6z \dots 2.)$

$y=9$

46.) $3x+2y-4z=12 \dots I.$

$x:y=3:4 \dots II.$

$y:z=8:7 \dots III.$

M.S.

$y=\frac{4x}{3} \dots II.$

$z=\frac{7}{8}y \dots III.$

$z=\frac{7}{8}\cdot\frac{4}{3}x=\frac{7x}{6}$

$3x+2\cdot\frac{4x}{3}-4\cdot\frac{7x}{6}=12 \dots I.$

$18x+16x-28x=72$

$6x=72$

$x=12$

$y=\frac{4x}{3}=16$

$z=\frac{7x}{6}=14$

47.) $x+y+z=36 \dots I.$

$x:y:z=4:5:9 \dots II.$

$(x+y+z):x=(4+5+9):4 \dots II.$

36

$36:x=18:4 \; ; \; x=8$

$(x+y+z):y=(4+5+9):5$

$y=10$

$z=18$

48.) $\frac{2}{x}+\frac{3}{y}+\frac{1}{z}=23$ | -1

$\frac{2}{x}+\frac{3}{y}+\frac{4}{z}=46 \dots II.$

$\frac{5}{x}+\frac{10}{y}+\frac{4}{z}=75 \dots III.$

$-\frac{2}{x}-\frac{3}{y}-\frac{1}{z}=-23$

$\frac{2}{x}+\frac{3}{y}+\frac{4}{z}=46$

$\frac{3}{z}=23 \; ; \; z=\frac{23}{3}$

$\frac{2}{x}+\frac{3}{y}+\frac{4}{\frac{3}{23}}=46 \dots II.$

$\frac{5}{x}+\frac{10}{y}+\frac{4}{\frac{3}{23}}=75 \dots III.$

$\frac{2}{x}+\frac{3}{y}=\frac{46}{3}$ | 10

$\frac{5}{x}+\frac{10}{y}=\frac{133}{3}$ | -3

$\frac{5}{x}=\frac{61}{3} \; ; \; x=\frac{15}{61}$

$y=\frac{5}{12}$

49.) $\frac{3}{x}+\frac{4}{y}-\frac{6}{z}=3$

$\frac{1}{x}-\frac{3}{y}+\frac{2}{z}=\frac{1}{6}$ | 3

$\frac{2}{x}+\frac{3}{2y}+\frac{1}{4z}=2\frac{5}{6}$

$\frac{3}{x}+\frac{4}{y}-\frac{6}{z}=3$

$\frac{3}{x}-\frac{9}{y}+\frac{6}{z}=\frac{3}{6}$

$\frac{6}{x}-\frac{5}{y}=\frac{7}{2}$

$\frac{1}{x}+\frac{1}{y}=\frac{3}{2} \dots 1.) \; | \; 5$

$\frac{6}{x}-\frac{5}{y}=\frac{7}{2}$

$\frac{5}{x}+\frac{5}{y}=\frac{15}{2}$

$\frac{11}{x}=\frac{22}{2}$

$x=1$

$\frac{1}{x}-\frac{3}{4}+\frac{2}{z}=\frac{1}{6}$ | -1

$\frac{2}{x}+\frac{3}{2y}+\frac{1}{4z}=\frac{17}{6}$ | 8

$-\frac{1}{x}+\frac{3}{y}-\frac{2}{z}=-\frac{1}{6}$

$\frac{16}{x}+\frac{12}{y}+\frac{4}{z}=\frac{136}{6}$

$\frac{15}{x}+\frac{15}{y}=\frac{135}{6}$ | :15

$\frac{1}{x}+\frac{1}{y}=\frac{1}{6}=\frac{3}{2} \dots 1.)$

$\frac{1}{y}=\frac{3}{2}-\frac{1}{x} \dots 1.)$

$\frac{1}{y}=\frac{1}{2} \; ; \; y=2$

$z=3$

50.) $\frac{2}{x}+\frac{1}{y}=\frac{9}{4} \dots I.$

$\frac{3}{2x}-\frac{2}{3y}=\frac{5}{6}$

$\frac{1}{3x}-\frac{3}{2z}=\frac{1}{6}$ } +

$\frac{1}{3x}-\frac{2}{3y}=\frac{6}{6}=1$ | $\frac{2}{3}$

$\frac{2}{x}+\frac{1}{y}=\frac{9}{4}$

$\frac{1}{3x}-\frac{2}{3y}=1$

$\frac{4}{3x}+\frac{2}{3y}=\frac{3}{2}$

$\frac{5}{3x}=\frac{5}{2}$

$3x=2 \; ; \; x=\frac{2}{3}$

$\frac{2}{\frac{2}{3}}+\frac{1}{y}=\frac{9}{4}$

$y=-\frac{4}{3}$

$z=\frac{9}{2}$

51.) $x+y=3 \dots I.$ M.S.

$x+z=6 \dots II.$

$x+u=5 \dots III.$

$x+z+u=8 \dots IV.$

$(x+u)+z=8$

$x+u=5$

$5+z=8$

$z=3$

$x+z=6 \dots II.$

$x=3$

$x+y=3 \dots I.$

$x=3$

$y=0$

52.) $x+2y+3z+4u=30 \dots I.$
$3x+5y+7z+u=38 \dots II.$
$5x+8y+10z-2u=43 \dots III.$
$7x+6y+5z+4u=50 \dots IV.$

$x+2y+3z+4u=30 \quad / \dots I.$
$5x+8y+10z-2u=43 \quad / 2 \dots III.$

$11x+18y+23z=116 \dots 1.)$
$11x+18y+24z=119 \dots 2.)$

$3x+2y+z=10 \dots 3.)$

$11x+18y+23z=116 \quad / -1$
$11x+18y+24z=119$

$z=3$

$3x+2y+3=10 \dots 3.)$
$3x+2y=7$
$11x+18y=47 \dots 2.) \quad / 9 \quad / -1$

$16x=16 \,;\; x=1 \,;\; y=2 \,;\; u=4$

$3x+5y+7z+u=38 \quad / 2$
$5x+8y+10z-2u=43$

$11x+18y+24z=119 \dots 2.)$
$x+2y+3z+4u=30 \quad / 4 \dots I.$
$7x+6y+5z+4u=50$

$6x+4y+2z=20$
$3x+2y+z=10 \dots 3.)$

53.) $7x-13y=7 \dots I.$
$10z-3u=11 \dots II.$
$3x+4u=94 \dots III.$
$2u+3y=47 \dots IV.$

$3x+4u=94 \quad / \dots III.$
$2u+3y=47 \quad / -2 \dots IV.$

$3x-6y=0$
$x=2y$ Supstituiraj u jednadžbu I.

$14y-13y=7$
$y=7 \,;\; x=14$

$2u+21=47 \dots IV.$
$u=13$

$10z-39=11 \dots II.$
$z=5$

Zadaci prvoga stepena sa više nepoznanica.

1.) $x+y=82$
$x-y=8$
$2x=90$
$x=45$
$y=37$

2.) $x+y=78$
$x=12y$
$12y+y=78$
$y=6$
$x=72$

3.) A ima x,
B ima y
$x+y=70$
$x-y=24$
$2x=94$
$x=47$
$y=23$

4.) Stariji ima x g, mlađi y
$x-4=2(y-4)$
$x-16=14(y-16)$
$x-2y=-4$
$x-14y=-208 \quad / -1$
$12y=204$
$y=17$
$x=30$

5.) x gusaka, y patka
$x+y=83$
$\frac{x}{2}\cdot 5+y=125 \quad / -1$
$\frac{5x}{2}-x=42$
$x=28$
$y=55$

6.) Prva vrsta x K druga y K
$5x+11y=7\cdot 70 \quad / 3$
$3x+2y=2\cdot 32 \quad / -5$
$15x+33y=2310$
$-15x-10y=-1160$
$23y=1150$
$y=0{\cdot}5K$
$x=0{\cdot}4K$

7.) x gusaka sa 2x nogu
i y ovaca sa 4y nogu.
$x+y=83$
$2x+4y=272 \quad / -2$
$2y=106$
$y=53$
$x=30$

8.) U jednoj sobi x, u drugoj y
$x+y=18$
$x-3=y+3$
$x+y=18$
$x-y=6$
$x=12$
$y=6$

9.) x gospode, y gospoja.
$x+y=47$ M.s.
$x-3=y$
$x+x-3=47$
$x=25$
$y=22$

10.) Vrsti uputa za zad. 30. §.70.
Bilo je x dječaka i y djevojčica.
Najstariji dječak ima (x-1) brata a
y sestara; djevojčica ima (y-1) sestru i
x brade.

$y-1=x$
$2(x-1)=y$ M.S

$y=x+1$
$2x-2=x+1$
$x=3;\ y=4$

11.) Sin ima x g, otac y

$y-4=5(x-4)$
$y+17=2(x+17)$ M.S

$y=4+5x-20$
$y=5x-16$
$5x-16+17=2x+34$
$x=11;\ y=39$

12.) Ljudi ima x, žena y

$5x+4y=900+25$
$4x+5y=900-25$

$5x+4y=925 \mid -4$
$4x+5y=875 \mid 5$

$9y=675$
$y=75;\ x=125$

13.) $x+y=47$

$\frac{x-5}{y}=5$

$x-5=5y$ M.S.
$x=5y+5$
$5y+5+y=47$
$6y=42$
$y=7;\ x=40$

14.) $x=y+5$
$x=5y$

$5y=y+5$
$y=\frac{5}{4};\ x=\frac{25}{4}$

15.) $10x+y+27=10y+x$

$\frac{x\cdot 3}{2}=y$

$-9x+9y=27$
$y-x=3$
$\frac{3x}{2}-x=3$
$x=6$
$y=9$

Traženi je broj 69

16.) Po uputi u knjizi.

$2x=y$
$y-1=14-(x+y)$

$2x-1=14-(x+2x)$
$2x-1=14-3x$
$5x=15$
$x=3$ Traženi je
$y=6$ broj 365
$z=5$

17.) Općenito je oblik troznamenkastog broja $100x+10y+z$

$x+y+z=11$ .... I.
$100z+10y+x+29=2(100x+10y+z)$ .... II.
$100x+10z+y-36=100x+10y+z$ .... III.

$98z-10y-199x+29=0$ .... II.
$9z-9y=36$ ... III.
$z-y=4$
$z=4+y$
$x+y+4+y=11$ ... I.
$x+2y=7$

$98(4+y)-10y-199x+29=0$
$392+98y-10y-199x+29=0$
$88y-199x+421=0$
$2y+x=7 \mid 199$

$486y=972$
$y=2;\ x=3;\ z=6$

Traženi je broj 326

18.) A ima x, B y

$\frac{(x+y)15\cdot 5}{100}=2772$
$\frac{5x}{100}=\frac{7y}{100}$

$x+y=50400$ M.S.
$5x=7y$

$x+\frac{5x}{7}=50400$
$12x=352800$
$x=24400$ K
$y=21000$ K

19.) Članova je bilo x,
a trošak iznosi y

$6x+20=y$ Metoda
$7x-20=y$ kompara-
cije

$6x+20=7x-20$
$x=40$
$y=260$ K

20.) A je popravio posao
za x dana, B za y dana
A s popravi za 1 dan $\frac{1}{x}$, B $\frac{1}{y}$ posla. Obojica
zajedno popravi za 1 dan $\frac{1}{6\frac{2}{3}}=\frac{3}{20}$ posla

/: Nastavak na drugoj strani :/

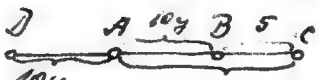
$\frac{1}{x}+\frac{1}{y}=\frac{3}{20}$ /-4

$\frac{5}{x}+\frac{4}{y}=\frac{2}{3}$ /

$\frac{1}{x}=\frac{1}{15}$

$x=15;\ y=12$

22.)



Brzina je jednaka x, drugog y u 1 sek.

$10x-10y=5$

$10x+10y=55$

$20x=60$

$x=3m;\ y=2{,}5m$

23.) Temperatura = $x°C = y°R$

$1°C=\frac{80}{100}=\frac{8}{10}°R$

$x+y=18$

$\frac{8}{10}x=y$

$x+\frac{8}{10}x=18$

$x=10;\ y=8$

25.) A radi x dana
B y dana.
Zajedno rade za prvih 20 dana $x=3{,}2$ "
(Preostalo je a, a 12 dana sam.)

$\frac{1}{x}+\frac{1}{y}=\frac{1}{15}$ /-8

$\frac{8}{x}+\frac{20}{y}=1$

$\frac{12}{y}=\frac{7}{15}$

$y=25\frac{5}{7}$

$x=36$

21.) Od jedna vrsta x m od druge y m

$7x+6{,}5y=27250$

$6{,}5x+7y=27250-500=26750$

$70x+65y=272500$

$14x+13y=54500$ /14

$13x+14y=53500$ /-13

$196x+182y=763000$

$-169x-182y=-695500$

$27x=67500$

$x=2500;\ y=1500$

24.) 1 kg čaja x
1 kg kave y

$8x+6y=34$

$8\left(x+\frac{10x}{100}\right)+6\left(y+\frac{20y}{100}\right)=38{,}24$

$4x+3y=17$

$800x+720y=3824$ /

$4x+3y=17$ /-220

$60y=84$

$y=1{,}4$ kuna

$x=3{,}2$ "

26.) A je radio x dana, a B $(x+7)$ dana.
A je dobio $4x$ K, a B $(x+7)\cdot 6$ K

$4x+(x+7)\cdot 6=242$

$4x+6x+42=242$

$x=20$ dana je radio A
B je radio 27 dana

27.) $x+y+z=11$

$100y+10x+z=100x+10y+z$ ... II.

$100x+10z+y=100x+10y+z+18$ ... III.

$90y=90x$ ... II.

$y=x$

$9z-9y=18$ ... III.

$z-y=2$ /-1

$z+2y=11$

$3y=9$

$y=3;\ x=3;\ z=5$

$x+y+z=11$

$2y+z=11$

Traženi je broj
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28.) Jedan kruj x K, drugi y K
a kola z K

$x+y+z=576$

$x+z=312$ }+

$y+z=360$ }

$x+y+2z=672$

$x+y+z=576$ /-1

$z=96K$

$x=216K$

$y=264K$

29.) x djece, y gospođa i z gospođa.

$x+y+z=70$

$x+y=3y$ ... II. M.S.

$x-y=z$

$y=\frac{x+y}{3}$ ... II.

$x+\frac{x+y}{3}+x-y=70$

$6x+x+y=231$

$7x=224$

$x=32,\ y=13;\ z=25$

30.) x jabuka, y krušaka
z breskva.

$x+y+z=1113$

$x=2y$ M.S.

$z=2x$

$x+\frac{x}{2}+2x=1113$

$\frac{7x}{2}=1113$

$x=318;\ y=159$

$z=636$

31.) $x+y+z=63$

$x=2y$ M.S.

$y:z=2:3$

$z=\frac{3y}{2}=\frac{3}{2}\cdot\frac{x}{2}=\frac{3x}{4}$

$y=\frac{x}{2}$

$x+\frac{x}{2}+\frac{3x}{4}=63$

$4x+2x+3x=252$

$9x=252$

$x=28;\ y=14;\ z=21$

32.) A treba x dana, B y dana C z dana.

$$\left.\begin{aligned}\tfrac{1}{x}+\tfrac{1}{y}&=\tfrac{1}{10}\\ \tfrac{1}{x}+\tfrac{1}{z}&=\tfrac{1}{12}\\ \tfrac{1}{y}+\tfrac{1}{z}&=\tfrac{1}{20}\end{aligned}\right\}+$$

$$\tfrac{2}{x}+\tfrac{2}{y}+\tfrac{2}{z}=\tfrac{14}{60}$$

$$\tfrac{1}{x}+\tfrac{1}{y}+\tfrac{1}{z}=\tfrac{7}{60}\quad\Big/-1$$

$$\tfrac{1}{x}+\tfrac{1}{y}=\tfrac{1}{10}$$

$$\tfrac{1}{z}=\tfrac{1}{60}$$

$$z=60$$

$$\tfrac{1}{x}+\tfrac{1}{y}+\tfrac{1}{z}=\tfrac{7}{60}$$

$$\tfrac{1}{x}+\tfrac{1}{z}=\tfrac{1}{12}\quad\Big/-1$$

$$\tfrac{1}{y}=\tfrac{2}{60}=\tfrac{1}{30}$$

$$y=30$$

$$\tfrac{1}{x}+\tfrac{1}{y}+\tfrac{1}{z}=\tfrac{1}{60}$$

$$\tfrac{1}{y}+\tfrac{1}{z}=\tfrac{1}{20}\quad\Big/-1$$

$$\tfrac{1}{x}=\tfrac{4}{60}=\tfrac{1}{15}$$

$$x=15$$

33.) $\left.\begin{aligned}x+y&=90\\ x-y&=17^\circ 24'\end{aligned}\right\}+$

$$2x=107^\circ 24';\ x=53^\circ 42';\ y=36^\circ 18'$$

34.) $\alpha+\beta+\gamma=180^\circ\ldots$ I.

$(180-\alpha):(180-\beta):(180-\gamma)=10:17:18$

$[(180-\alpha)-(180-\beta)+(180-\gamma)]:(180-\beta)=(10-17+18):17$

$(180-\alpha-\gamma+\beta):(180-\beta)=11:17\ \ldots$ 1.)

$180-\alpha-\gamma=\beta\ \ldots$ I.

$2\beta:(180-\beta)=11:17\ \ldots$ 1.)

$34\beta=1980-11\beta$

$\beta=44^\circ$

$[(180-\alpha)+(180-\beta)-(180-\gamma)]:(180-\gamma)=(10+17-18):18$

$(180-\alpha-\beta+\gamma):(180-\gamma)=9:18=1:2\ \ldots$ 2.)

$180-\alpha-\beta=\gamma\ \ldots$ I.

$2\gamma:(180-\gamma)=1:2\ \ldots$ 2.)

$4\gamma=180-\gamma$

$5\gamma=180$

$\gamma=36^\circ$

$\alpha=100^\circ$

35.) Katete su x i y

$$x+y=28$$

$$\frac{(x+2)(y-2)}{2}=\frac{xy}{2}+2$$

$$(x+2)(y-2)=xy+4$$

$$xy+2y-2x-4=xy+4$$

$$2y-2x=8$$

$$y-x=4$$

$$y+x=28$$

$$y=16;\ x=12$$

36.) Visine su x i y

$$x+y=20$$

$$\frac{ax}{2}:\frac{a}{2}y=2:3$$

$$x:y=2:3$$

$$y=\frac{3x}{2}$$

$$x+\frac{3x}{2}=20$$

$$5x=40$$

$$x=8;\ y=12$$

37.) Stranice su x i y

$$x-y=5$$

$$(x-3)(y+1)+12=xy$$

$$xy-3y+x-3+12=xy$$

$$3y-x=9$$

$$-y+x=5$$

$$y=7;\ x=12$$

38.) Veća je stranica x, manja y

$$(x+3)(y+7)=xy+228$$

$$(x+7)(y+3)=xy+184$$

$$xy+3y+7x+21=xy+228$$

$$xy+7y+3x+21=xy+184$$

$$3y+7x=207\quad\Big/7$$

$$7y+3x=163\quad\Big/-3$$

$$40x=960$$

$$x=24;\ y=13$$

39.) Dijagonale su x i y

$$x-y=5$$

$$\frac{(x+2)(y+2)}{2}=\frac{xy}{2}+30$$

$$xy+2y+2x+4=xy+60$$

$$2x+2y=56$$

$$x+y=28$$

$$x-y=5$$

$$x=\frac{33}{2};\ y=\frac{23}{2}$$

Izrada je u knjizi pogrješna.

40.) Uzporedne su stranice x i y

$$x-y=6$$

$$\frac{(x+y)8}{2}=144$$

$$x+y=36$$

$$x-y=6$$

$$x=21;\ y=15$$

41.) Jedan ima x tranica drugi y.

$$x - y = 5$$

$$\frac{(x-3)x}{2} - 40 = \frac{(y-3)y}{2}$$

$$y = x - 5$$

$$(x-3)x - 80 = (x-5-3)(x-5)$$

$$10x = 120$$

$$x = 12;\ y = 7$$

42.) x kg prve vrste i y kg druge i treće.

$$x + 2y = 144$$

$$\frac{48x + 36y + 24y}{144} = 40 \ldots \text{II.}$$

$$\frac{12x + 9y + 6y}{144} = 10$$

$$4x + 5y = 480 \mid \cdot(-1)$$

$$x + 2y = 144 \mid \cdot 4$$

$$3y = 96$$

$$y = 32;\ x = 80$$

U knjizi je pogrješno uzeta jednaka množina I. i II. vrste.

43.) U 6kg 40% srebra čistine 0·750 ima 6·40 · 0·750 kg čista srebra. Prve vrste uzme x, druge $\frac{x}{2}$ treće y

$$x \cdot 0{\cdot}670 + \frac{x}{2} \cdot 0{\cdot}720 + y \cdot 0{\cdot}900 = 6{\cdot}40 \cdot 0{\cdot}750$$

$$x + \frac{x}{2} + y = 6{\cdot}40$$

$$67x + 36x + 90y = 480$$

$$103x + 90y = 480 \mid \cdot(-1)$$

$$3x + 2y = 128 \mid \cdot 45$$

$$32x = 96$$

x = 3kg prve vrste, 1·5kg druge vrste

y = 1·9kg treće vrste

44.) Po knjizi.

45.) Od bolje vrste uzeti će x l. Od lošije 3x l. Smjesi dolije još y l vode. Misli se na to, da je voda bezvrijedna.

$$x + 3x + y = 3825$$

$$\frac{40 \cdot 3x + 60 \cdot x}{3825} = 32$$

$$4x + y = 3825$$

$$\frac{180x}{3825} = 32$$

$$45x = 30600$$

$$x = 680\,l$$

680 l bolje vrste
2040 l lošije vrste
i 3825 − 680 − 2040 =
= 1105 l vode.

46.) Baka će uzeti x kg čista srebra 3x kg a srebra čistine 0·900 y kg. Vidi zad 43.

$$3x \cdot 1 + y \cdot 0{\cdot}900 = 1{\cdot}38 \cdot 0{\cdot}835$$

$$3x + x + y = 1{\cdot}38 \quad \text{M.S.}$$

$$4x + y = 1{\cdot}38$$

$$y = 1{\cdot}38 - 4x$$

$$3x + (1{\cdot}38 - 4x)\,0{\cdot}900 = 1{\cdot}38 \cdot 0{\cdot}835$$

$$3x - 3{\cdot}6x + 1{\cdot}242 = 1{\cdot}1523$$

$$0{\cdot}6x = 0{\cdot}0897$$

x = 0·1495 kg bakra, 3·0·1495 = 0·4485 kg čista srebra i 0·982 kg srebra čistine 0·900

47.) x l po 80k ; y l vode.

$$162 + x + y = 258$$

$$162 \cdot 46 + x \cdot 80 = 258 \cdot 54$$

$$x + y = 96$$

$$80x = 258{\cdot}54 - 162 \cdot 46$$

$$80x = 13932 - 7452 = 6480$$

x = 81l vina po 80k
vode dolije 15..

48.) Vidi u knjizi.

49.) Od druge vrste uzme x, od treće $2x$, od četvrte $3 \cdot 2x = 6x$, a od prve vrste y kg.

$$y + x + 2x + 6x = 260$$
$$1 \cdot 20 \cdot y + 140 \cdot x + 2 \cdot 20 \cdot 2x + 3 \cdot 6x = 260 \cdot 2 \cdot 40$$
$$12y + 14x + 44x + 180x = 260 \cdot 24$$
$$12y + 238x = 6240$$
$$6y + 119x = 3120$$
$$y + 9x = 260 \quad / \cdot (-6)$$
$$65x = 1560$$
$$x = 24$$
$$y = 44$$

od I. vrste uzme 44 kg
" II. " " 24 "
od III. " " 48 "
" IV. " " 144 "

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§ 72. Čiste kvadratične i čiste kubične jednadžbe.

1.) $x^2 - 49 = 0$
$x^2 = 49$
$x = \pm 7$

2.) $3x^2 = 192$
$x^2 = 64$
$x = \pm 8$

3.) $\frac{x}{6} = \frac{6}{x}$
$x^2 = 36$
$x = \pm 6$

4.) $\frac{x^2}{x} = 2x$
$2x^2 = 72$
$x^2 = 36$
$x = \pm 6$

5.) $2 : x = x : 32$
$x^2 = 64$
$x = \pm 8$

6.) $x(x+1) = x+4$
$x^2 + x = x + 4$
$x^2 = 4$
$x = \pm 2$

7.) $\frac{1}{x-3} - 1 = \frac{x-4}{x^2-9} \quad / (x^2-9)$
$x + 3 - x^2 + 9 = x - 4$
$x^2 = 16$
$x = \pm 4$

8.) $3x(x+1) = 3x + 2478843$
$3x^2 + 3x = 3x + 2478843$
$x^2 = 826281$
$x = \pm 909$

9.) $11 - \frac{x+55}{x^2} = 3 - \frac{x-25}{x^2}$
$11 - 3 = \frac{x+55}{x^2} - \frac{x-25}{x^2}$
$8x^2 = 80$
$x^2 = 10$
$x = \pm\sqrt{10}$

10.) $\frac{(12+x)(x-3)}{12-x} = x + 3$
$(12+x)(x-3) = (12-x)(x+3)$
$12x + x^2 - 36 - 3x = 12x - x^2 + 36 - 3x$
$2x^2 = 72$
$x^2 = 36; \; x = \pm 6$

11.) $(2x-3)(2x+3) = 7$
$4x^2 - 9 = 7$
$4x^2 = 16$
$x^2 = 4; \; x = \pm 2$

12.) $\frac{x}{x+2} + \frac{x}{x-2} = \frac{8}{3}$
$\frac{x(x-2) + x(x+2)}{x^2-4} = \frac{8}{3}$
$\frac{2x^2}{x^2-4} = \frac{8}{3}$
$6x^2 = 8x^2 - 32$
$x^2 = 16; \; x = \pm 4$

13.) $4x^3 = 1372$
$x^3 = 343$
$x = 7$

U knjizi kokarska pogriješka

14.) $\frac{x^2}{25} = \frac{29160}{x}$
$x^3 = 729000$
$x = 90$

15.) $(x^2 - 6x)(x+6) = 6 \cdot 859 - 36x$
$x^3 - 6x^2 + 6x^2 - 36x = 6859 - 36x$
$x^3 = 6859; \; x = 19$

16.) $3x \cdot 6x = 540$
$18x^2 = 540$
$x^2 = 30$
$x = \pm\sqrt{30}$

17.) $\frac{x}{5} : \frac{x}{7} = 4235$
$\frac{x^2}{35} = 4235$
$x^2 = 148225$
$x = 385$

18.) $x:y = 11:13$

$xy = 7007$

$y = \frac{13x}{11}$

$x \cdot \frac{13x}{11} = 7007$

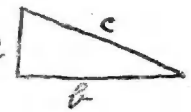
$\frac{13x^2}{11} = 7007$

$\frac{x^2}{11} = 539$

$x^2 = 5929$

$x = \pm 77;\ y = \pm 91$

19.)



$c = 34$

$a = 30$

$b = ?$

$b^2 = c^2 - a^2$

$b = \pm\sqrt{c^2 - a^2}$

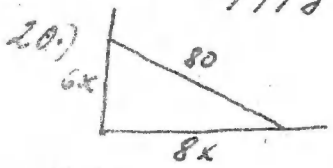
$b = \pm\sqrt{34^2 - 30^2}$

$b = \pm\sqrt{(34+30)(34-30)}$

$b = \pm\sqrt{64 \cdot 4} = 8 \cdot 2$

$b = \pm 16$

20.)

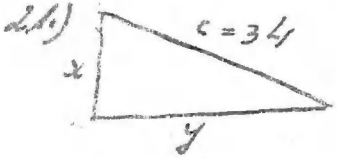


$(6x)^2 + (8x)^2 = 80^2$

$100x^2 = 6400$

$x = \pm 8$ sec.

21.)



$x:y = 8:15$ M.S

$x^2 + y^2 = 34^2$

$y = \frac{15x}{8}$

$x^2 + \left(\frac{15x}{8}\right)^2 = 34^2$

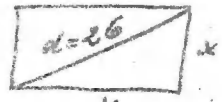
$x^2 + \frac{225x^2}{64} = 1156$

$289x^2 = 73984$

$17x = 272$

$x = 16;\ y = 30$

22.)



$x:y = 5:12$ M.S

$x^2 + y^2 = 26^2$

$y = \frac{12x}{5}$

$x^2 + \frac{144x^2}{25} = 676$

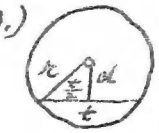
$\frac{169x^2}{25} = 676$

$\frac{13}{5}x = 26$

$x = 10$

$y = 24$

23.)



$r^2 = d^2 + \left(\frac{t}{2}\right)^2$

$r^2 = 10^2 + \left(\frac{21}{2}\right)^2$

$r^2 = 100 + \frac{441}{4}$

$r^2 = \frac{841}{4}$

$r = \frac{29}{2} = 14.5$

24.)

$p = \frac{x \cdot v}{2}$

$y^2 = v^2 + \left(\frac{x}{2}\right)^2$

$168 = \frac{24x}{2}$ ... I.

$y^2 = 24^2 + \frac{x^2}{4}$

$12x = 168$ ... I.

$x = 14$ M.S

$y^2 = 24^2 + \frac{x^2}{4}$

$y^2 = 24^2 + \frac{14^2}{4}$

$y^2 = 625$

$y = 25$

25.) $\frac{a}{2}\sqrt{3} = 24$

$a = \frac{48}{\sqrt{3}}$

$p = \frac{a}{2} \cdot \frac{a}{2}\sqrt{3} = \frac{\frac{48}{\sqrt{3}}}{2} \cdot 24 =$

$= \frac{48}{\sqrt{3}} \cdot 12 = 48 \cdot \sqrt{3} \cdot 4$

$p = 192\sqrt{3}$

26.) $r^2\pi = 100$

$r = \sqrt{\frac{100}{\pi}} = \sqrt{\frac{100\pi}{\pi^2}}$

$r = \frac{10}{\pi}\sqrt{\pi}$

27.)

Stranica kvadrata = je $\frac{1}{4}$ opsega, dakle $a = 6$

$r = \frac{1}{2}d$

$a = a\sqrt{2}$

$r = \frac{1}{2}a\sqrt{2}$

$r = \frac{1}{2} \cdot 6\sqrt{2} = 3\sqrt{2}$

Sadržaj.

Prvih je 17 paragrafa izostavljeno poradi jednostavne izrade.

Djelji vostbrojeva.

Računanje s razlomcima.

Zaključni račun.

Omjeri i razmjeri.

Dioberno pravilo. ..... 66.

Skraćeno računanje s decimalnim brojevima.

Opća aritmetika.

Umoljava se, da se eventualne
pogriješke i nedostaci jave
pismeno nakladnoj knjižari.

J. Bogdić Imiš 20/IV. 1918.

(Gimnazijalac.)